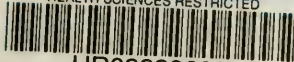


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FIFTH ANNUAL REPORT

OF THE

STATE BOARD OF HEALTH,

OF THE

STATE OF OHIO,

TO THE

GOVERNOR OF THE STATE OF OHIO,

FOR THE

YEAR ENDING OCTOBER 31, 1890.

3825

COLUMBUS:

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OHIO STATE BOARD OF HEALTH,
OFFICE OF THE SECRETARY,
COLUMBUS, OHIO, *January 7, 1891.*

To His Excellency, JAMES E. CAMPBELL, Governor of Ohio:

SIR: In accordance with Section 8 of the "Act to create and establish a State Board of Health," the accompanying report is herewith submitted for the year ending October 31, 1890.

Respectfully,

C. O. PROBST, *Secretary.*

GENERAL REPORT.

The Fifth Annual Report of the State Board of Health for the year ending October 31, 1890, is herewith presented.

PERSONNEL OF THE BOARD.

There has been but one change in the personnel of the Board since the last report. This was occasioned by the death of Dr. W. H. Cretcher, who died at his home in Bellefontaine, January 23, 1889. The vacancy thus created was filled by the appointment of Dr. S. A. Conklin, of Canton, for the unexpired term ending December, 1893. The term of office of Dr. S. P. Wise having expired by limitation December, 1889, he was re-appointed for the term ending December, 1896. The names and addresses of the members of the Board are as follows:

THOS. C. HOOVER, M. D., <i>President</i>	Columbus.
D. H. BECKWITH, M. D.....	Cleveland.
H. J. SHARP, M. D.....	London.
S. A. CONKLIN, M. D.....	Canton.
EDWARD T. NELSON, M. A. PH. D.....	Delaware.
JOSEPH L. ANDERSON, M. D.....	Cincinnati.
SIMON P. WISE, M. D.....	Millersburg.
D. K. WATSON, <i>Attorney-General, Ex-officio.</i>	

MEETINGS OF THE BOARD.

Four meetings of the Board were held during the year; three at Columbus, and one at Tiffin.

An invitation was extended to the Superintendents of public schools in Ohio to meet the Board in Columbus at its April meeting, for the purpose of discussing questions relating to school hygiene. A comparatively large number of prominent school men attended this meeting, and three public sessions were held in the Universalist church. The attendance at all sessions was encouragingly large, and some very excellent papers were read and discussed. The papers and discussions were published in the Monthly Sanitary Record, the official organ of the Board, and copies were sent to the Superintendents of schools throughout the State, and to many others interested in school hygiene. The Superintendents and teachers present

were enthusiastic over the success of the meeting, and it is expected to hold a similar convention next year in connection with the State Teachers' Convention.

As it is generally conceded that the most hopeful plan for securing lasting improvements in sanitation is by instructing our school children in matters of hygiene, such meetings of their instructors can not but result in much good, and it is a matter for congratulation that our teachers have shown themselves so greatly interested in this subject.

At the meeting in Tiffin, public sessions were held in Shawan's Opera House, where papers of great interest, relating to private and public sanitation, were read and discussed.

HEALTH AND SANITARY CONDITION OF THE STATE.

Reports from local Boards of Health and from other sources indicate that the general health of the State has been good during the past year. The only disease that prevailed epidemically was influenza.

Beginning in Russia, near the close of 1889, it soon reached our Eastern borders and rapidly extended over the entire continent. A very large number of cases occurred in our State—it is impossible even to approximate the total number—and while it was in most cases a mild affection, it was often followed by prolonged prostration. Indirectly it was the cause of a large number of deaths. During the month of January the mortality reports from cities and towns showed the highest death rate of any month since the establishment of the Board. The diseases specially influenced by the epidemic were pneumonia, bronchitis and consumption, but principally pneumonia. The epidemic wave reached its highest point during the month of December, but its effect on the mortality rate was not felt until the following month. In December 412 deaths were reported from pneumonia, bronchitis and consumption, 157 of them being from pneumonia; in January 730 deaths, of which 379 were from pneumonia; while in February the deaths from these three diseases dropped to 458, with 168 from pneumonia.

Many localities in the State have had limited epidemics of other diseases, but with the exception of influenza none of these have extended over large areas or affected the State generally.

Small-pox. But one outbreak of small pox occurred during the year. This was in the family of a rag peddler at Deunquat, a small village on the T. & O. C. R. R., in Wyandot county. The Board took prompt action in the case, quarantining the family and vaccinating all exposed persons, and as a result the disease was confined to the family in which it first appeared.

An outbreak of small-pox occurred on Pt. Pelee Island in Lake Erie, which occasioned much alarm on our lake borders. Highly sensational reports were sent out from Sandusky, and many of our lake ports were clamorous for quarantine restrictions. The Board was in constant communication with the health authorities of Canada, and was enabled to correct these false reports that were creating so much alarm. Restrictive quarantine regulations were confined to those not provided with a health certificate from proper authorities of the Island. The result was highly satisfactory, as not a case was imported to our State.

DIPHThERIA AT THE OHIO SOLDIERS' AND SAILORS' ORPHANS' HOME.

A very serious epidemic of diphtheria occurred at the Ohio Soldiers' and Sailors' Orphans' Home at Xenia, a full account of which may be found in the body of this report. Scarlet-fever, unfortunately, occurred at the same time, and, there being some delay in properly isolating affected children, nearly every cottage was infected at the time the Board was first called. Prompt assistance was rendered, and by the vigorous enforcement of the measures recommended the disease was soon under control, but not until thirty-eight deaths had resulted. By direction of the Legislature a thorough inspection of the Home was subsequently made by the Board, and a number of serious faults respecting its sanitary condition were pointed out in a report made to that body. Faulty and worn-out plumbing, over-heated, damp living rooms, crowded and un-ventilated dormitories, and a polluted water supply may be mentioned as the worst of these.

Legislature, acting upon the report of our Board, was prompt to grant liberal appropriations for sanitary improvements, and we are pleased to report that there has been a most commendable change in the sanitary condition of this institution. The plumbing has been thoroughly overhauled and new water closets provided throughout, rotting floors in bath and wash rooms have been replaced with new ones, additional cottages have been commenced to relieve over-crowding, a modern hospital, with a special cottage for infectious diseases is being built, and an adequate amount of pure water has now been secured. With these changes completed the Home will be in a very excellent sanitary condition.

We desire, in this connection, to call your attention to the sad lack of hospital accommodations to be found at many of the public institutions. Few of them are so constructed that a case of contagious disease can be properly isolated. As diseases of this class are specially liable to occur among children, we would specially urge and recommend that a contagious disease hospital be provided at each of our public institutions for

children, where all cases of contagious diseases can be properly isolated and cared for.

As previously stated, many conditions inimical to health were found at the Home at Xenia. Most of our institutional buildings were erected years ago when the questions of heating and ventilation, sewerage and plumbing, etc., were in a great measure unsolved. Immense strides have been made in these directions within the last ten years, and many changes in the sanitary arrangements of our public institutions could be pointed out which would be greatly beneficial to the health of the inmates.

By the authority of the act creating the Board which provides that "they shall advise officers of the Government, or other State Boards, in regard to the location, drainage, water supply, disposal of excreta, heating and ventilation of public buildings," a series of investigations, contemplating a thorough sanitary inspection of all the public institutions, have been commenced, and it is expected that many sanitary evils will be found, and, it is to be hoped, corrected.

The following State institutions have already been inspected by the Board: The Boys' Industrial School at Lancaster, the Girls' Industrial Home at Delaware, the Ohio Soldiers' and Sailors' Orphans' Home at Xenia, the Imbecile Asylum and the Deaf and Dumb Asylum at Columbus.

The Imbecile Asylum was found in a most excellent sanitary condition and was the only institution visited where some changes were not demanded. The arrangements for heating and ventilation, the sewerage and plumbing and the lighting of school rooms, were all that could be desired. We regret that the same can not be said of the Deaf and Dumb Asylum. The plumbing in this building is in a most dangerous condition. Through faulty construction and bad repair the inmates are almost constantly exposed to the dangers of sewer gas which has a ready entrance to many parts of the building. The water for drinking purposes is from an open well. This source of supply is always more or less dangerous in the thickly populated parts of cities. Samples of the water were submitted to Prof. Weber, of the O. S. University, for examination. His report shows that this well is undoubtedly highly polluted and an unsafe source of supply. The use of this water should be stopped.

CHEESE POISONING.

The subject of "cheese poisoning" has again come before the Board on account of a number of cases having occurred in Ohio. An inquiry as to the cause of the trouble has been prosecuted as fully as possible. The factories where the poisonous cheese was made have been carefully

inspected and the method of manufacture at each fully noted; chemical and biological analyses of the cheese and physiological experiments have been made to determine the cause of the sickness. Since the discovery of "tyrotoxin" in poisonous cheese by Prof. Vaughan, cases of sickness following the ingestion of cheese have been quite generally attributed to this substance, and the chemical analyses of the samples of cheese received by the Board have been directed to finding tyrotoxin. These were separately examined by three chemists well qualified for work of this character, but in none of them was tyrotoxin found. Physiological experiments, by feeding an etherial extract to kittens, were also attended with negative results, so it may be confidently stated that the sickness produced by the cheese examined was not due to tyrotoxin.

Two of the samples received were submitted to a biological examination and in each a micrococcus was found, seemingly identical with micrococci found in poisonous dried beef and head cheese. A similar germ was found in poisonous cheese by Dr. Sternberg in 1884, but whether cheese sickness is in any way attributable to its presence will require further research to determine.

GROWTH OF SANITATION.

It is gratifying to report that there has been a decided growth in the interest shown in sanitary work in the State at large, and that many lasting improvements of this character have been made during the year. This is made evident by the promptness with which outbreaks of contagious diseases are controlled, by the greater attention given to municipal cleanliness, by the large number of towns seeking improvements in sewerage and water supplies, and by the frequency with which the State Health Department has been called upon for aid and advice. This creation of a popular sentiment in favor of better sanitation, in most part due to the united efforts of the State and local Boards of Health, is hailed as a hopeful sign of greater improvements of the public health, yet to come. The demands upon the State Board of Health have been more numerous than ever before. Questions relating to improvements of sewerage and water supplies, the disposal of excreta and garbage, the location of school-houses, the control of epidemic diseases and the abatement of nuisances, etc., are being constantly referred to the Board for aid and advice. All have received prompt attention, and, either by letter or in person, all possible aid has been given.

LOCAL BOARDS OF HEALTH.

There has been a considerable gain in the number of local Boards of Health since the last report. The law requires that a board shall be

established in every city and village of over 500 inhabitants, but as the census of 1880 has determined our municipal population, many towns of over five hundred population at the present time, escaped its provisions. We may expect the returns of the census of 1890 to largely increase the number of local health organizations.

As a rule the local Boards of Health are active organizations and have accomplished a large amount of work during the year. The exceptions are in the small towns, where it is undoubtedly more difficult to enforce sanitary laws than in cities.

Too much praise can not be given to the health officers of some of our small towns. Many of these, almost alone, and often without compensation, have borne all the labors of a board of health, sacrificing time and business in the interest of public health. The law contemplates a board of seven men in each town to look after the public health, and the health officer, as its executive officer, should not be allowed to bear unsupported all the burdens of public service.

Included in this report may be found the reports of local boards of health, showing the amount and character of sanitary work performed during the year. These reports will show that increasing attention is being given to those factors of town-life that injuriously affect health, and that measures for preventing the spread of contagious diseases are better understood and more generally applied than ever before.

The public health, perhaps, depends to a larger extent upon an adequate supply of pure water than upon any other single factor, and it is encouraging to note the number of towns that are taking measures to provide public supplies of pure water. Special legislation was secured by thirteen cities and towns last year authorizing expenditures for water-works. This should mean increased healthfulness for the inhabitants of these towns, but through mismanagement, fraud and ignorance this does not always follow. Often the source of a public water supply is of questionable purity; such was found to be the condition at Tiffin and is notably so at Cincinnati. In towns having public water supplies the majority of people are using wells, often grossly polluted. Some of our towns have water-works but no system of sewerage. Such an arrangement is of more than doubtful wisdom. In this case there will be a large amount of water used—much larger than when wells and cisterns have furnished the entire supply, and this water, fouled by the various uses made of it must all, or nearly all, be drained away through the soil leaving behind it, but in an ever widening circle, the filth and waste matters it has collected, which in many cases sooner or later reaches the wells, while the gases from its decomposition permeate the soil and are drawn into basements and cellars poisoning the air of dwelling-houses. Water-works and sewerage should,

in all cases go hand-in-hand. Sewerage without water-works means filthy unflushed sewers, with which no occupied house should be connected, while water-works without sewerage eventually leads to a filth sodden soil which is always detrimental to health and often a breeder of epidemic diseases.

A complete list of all public water-works in Ohio, with a brief history and short description of each, may be found in the body of this report.

Sewerage. Extensive improvements in sewerage have also been made during the year. The legislature, at its last session, authorized the expenditure of over a million of dollars for this purpose. It is a sad fact that large amounts of money are being mis-spent in this direction. A system of sewerage *properly constructed* will in all cases improve the healthfulness of a community; but it is much better to keep filth in sight than to send it through improperly constructed sewers where much of it will remain giving out poisonous gases of putrefactive decomposition, or leak through bad joints into the soil adjacent to wells and dwelling-houses. Too often sewers are constructed by, and are under the supervision of, incompetent and dishonest men, and what should be a public blessing may become a public curse.

PUBLICATIONS.

The Monthly Sanitary Record, the official organ of the Board, has been continued throughout the year, and has afforded a medium for publishing many lessons in sanitation, drawn from experiences in our own State, and from investigations made in other States and countries relating to the prevention of disease.

The Weekly Health Bulletin, begun four years ago, has been continued. The form has been changed so that only infectious diseases, as reported by local Boards of Health, are included. Reports are received from over one hundred cities and towns, and as the Bulletin is sent to all health officers in the State, they are at all times informed of the localities where dangerous communicable diseases are prevailing.

The pamphlets issued by the Board, treating of the methods for preventing diphtheria, scarlet fever, typhoid fever, etc., have been distributed as occasion has required.

With the aid of George P. Hunter, Esq., of Warren, Ohio, a pamphlet has been prepared relating to the powers and duties of local boards of health. The health laws of the State frequently offer an insufficient guide to the course to be pursued in many difficulties arising in sanitary work, and this pamphlet will undoubtedly be of much value to local health organizations. Mr. Hunter is not only thoroughly familiar with the sanitary laws of Ohio, but has been an active member of a local board

of health for many years, and is therefore specially fitted for giving instructions in the many legal questions involved in public health work

VITAL STATISTICS.

There is great necessity for some changes in legislation relating to the collection of vital statistics. It needs no argument in the face of what has been done in other States and countries to prove the value of such statistics; the necessity for such work has long been recognized in our State, and attempts to collect such facts have been made in Ohio for nearly forty years. A large amount of money and much time has been wasted in this work, for Ohio's vital statistics are next to worthless. No deductions can be drawn from them as to our losses by deaths from preventable causes, nor of our gains by births. The present system of collecting births and deaths is through the agency of the assessors, who annually go from house to house, and from what they are told by the heads or members of families visited, record the required facts. It needs but little thought to see that this method can never even accurately enumerate, to say nothing of the more important facts which should be known regarding the circumstances attending such births and deaths

The faults of the present system of collecting vital statistics, and the necessity for radical changes thereof, have been fully considered in former reports of the Secretary of State, and in the first report of the State Board of Health, to which we respectfully refer you.

It is sincerely to be hoped that this matter will receive attention from the present General Assembly, and that such changes in legislation will be made as will insure a complete and accurate registration of the vital statistics of our State.

Secretary's Report.

ABSTRACT OF PROCEEDINGS OF THE BOARD AT ITS MEETINGS DURING
THE YEAR ENDING OCTOBER 31, 1890.

JANUARY MEETING.

The regular meeting of the State Board of Health was held in Columbus January 15, 1890.

In the absence of the President, Dr. Beckwith, Dr. Hoover was chosen President *pro tem*.

The members present were Drs. Hoover, Sharp, Cretcher, Anderson and Prof. Nelson.

Dr. H. J. Detmers, of the O. S. University; Dr. Frank Billings, of Chicago; Dr. J. C. Culbertson, of Cincinnati, and Dr. C. M. Wanzer, member of Legislature, were present as invited guests.

Dr. Detmers addressed the Board on the subject of meat inspection.

He dwelt especially on the dangers attending the use of either the flesh or milk of tuberculous cows, and urged the importance of providing for the inspection of all animals used for human food, both before and after slaughter.

He spoke also of the danger of eating the flesh of hogs affected with trichinosis, and proposed as a measure to eradicate this disease among hogs, that it be made compulsory to bury all dead animals immediately after death. In support of this measure he stated that trichinosis in hogs was nearly always due to their feeding on the carcasses of other animals containing the *trichina spiralis*, which produces the disease.

Dr. Billings was invited to address the Board, and spoke at some length in favor of a bill in Congress, which provides for the establishment of a National Laboratory for the original investigation of diseases of man and animals.

Dr. Culbertson addressed the Board on the subject of sewerage and water supply for suburban districts of Cincinnati—especially those situated along the course of Mill Creek.

He spoke of the unusual exodus of Cincinnati people to these districts, that has followed recent reductions in rates and increased facilities of transportation.

The only outlet for the sewerage of this region is Mill Creek, a sluggish stream of small depth in dry weather, which is already receiving the sewage of a number of small villages, of the insane asylum, zoological garden and other public buildings. In addition this creek is the natural outlet for the drainage of a large and thickly populated area.

About nineteen-twentieths of the dairies supplying Cincinnati with milk are within this district; and the water given to the cows is entirely unfit for use in dry weather, being little better than sewage. The doctor was of the opinion that many children die from the use of such milk.

Dr. Culbertson, in the *Lancet and Clinic* of January 11th, proposes the following measures for relieving this district of its sewage: At the north end of Lockland a new canal-bed should be located in the channel of Mill Creek and follow the straightened bed of the creek to the river.

This new canal should receive all the water from all the tributaries of Mill Creek and sewers as far south as North Cumminsville, as well as all the water from the canal (the Miami and Erie canal) at Lockland and all the sewage of the entire Mill Creek watershed. The canal, creek and sewer should be made to form a sort of slack-water navigation purpose from Lockland to the river, with a large capacity, and kept constantly filled with water drawn from the State dam above Middletown. This canal could be made of the greatest commercial use by the construction of large locks at the exit to the river, sufficient to receive the largest sized coal barges, while the sides of the canal should be walled to a height corresponding with sixty to sixty-five feet of water at the present city waterworks. No sewers being tapped into this canal south of North Cumminsville, these side-walls would be a complete barrier to all ordinary overflow and back-water from the Ohio, and would add many fold to the value of the entire Mill Creek bottom. The enlarged canal would allow shipments of coal in original barges to all points on its banks as far north as Lockland. Piers could be built at intervals that would still further enhance the commercial utility of the line. However, the greatest and most valuable of all purposes would be its practical solution of the extensive sewerage system of a large and populous area, and which vitally concerns the health and welfare of half a million of people.

Dr. Culbertson suggested the propriety of the State Board of Health appointing a committee to investigate the conditions outlined by him, with the view of making a report thereon to the Legislature.

The Secretary presented communications from Dr. Sutton, health officer of Zanesville; Dr. Rauch, Secretary of the Illinois Board of Health,

and Dr. Tomlinson, Registrar of Chicago, relative to the shipment from Chicago to Zanesville of the body of a child that had died of diphtheria. The body was exposed to view in Zanesville, and a number of cases of diphtheria and several deaths resulted.

The Secretary was instructed to pursue the investigation until all the facts bearing on the case could be learned and substantiated.

The rules for the transportation of dead bodies adopted by the Board were taken up for discussion and modified so that corpses could be shipped by express without being accompanied by a person in charge; also relieving baggage agents of all responsibility in shipments made by express.

The Secretary presented a circular letter recently sent to Superintendents of Public Schools, inviting them to participate in a meeting with the State Board of Health for the purpose of discussing questions relating to school hygiene. A number of letters were read from Superintendents who expressed themselves in sympathy with such a meeting and promised their support.

The Secretary was authorized to arrange a program for a meeting of this kind, to be held at Columbus, in April.

An amendment to the by-laws was adopted, changing the time of regular meetings of the Board from the third to the fourth Wednesday of January, April, June and September.

The Secretary presented the following quarterly report:

SECRETARY'S QUARTERLY REPORT.

Mr. President and Members of the Board:

Your Secretary begs leave to submit the following report:

I take pleasure first in announcing that the Governor, on November 27, re-appointed Dr. S. P. Wise a member of this Board for the term of seven years, ending December 13, 1896.

The circular adopted at the last meeting relative to a report by health officers on the sanitary condition of school-houses, was not sent out as the report on ventilation was to rest entirely on the use of Walpurt's Air Tester, and it was deemed advisable to have the instrument itself tested before sending it out. Prof. Nelson kindly agreed to have this done, but has not yet made a final report.

On November 18, I was requested to come to Lancaster and advise with the Board of Health just established, as to measures to be taken to control a serious outbreak of diphtheria in that city.

The board had been organized a few days prior to the 18th, and had already inaugurated vigorous measures for stamping out the disease.

The health officer, Dr. Lewis, reported that he had visited every physician in the city and secured a list of the cases of diphtheria each had treated.

The first case occurred September 18, and seventy-six cases and eleven deaths were reported up to November 18.

The exact location of the majority of these cases was not known, but in all recent cases the houses were being placarded, physicians being required to report the names and residences of all patients.

It was reported at the meeting that in several instances cases of simple sore throat had been called diphtheria and the houses placarded, unjustly increasing unfavorable reports as to the extent of the epidemic; and the health officer was accordingly instructed (without our advice, however), to personally visit each case of infectious disease reported, and satisfy himself as to the correctness of the diagnosis before placarding the house. This was agreed to by all the physicians present, six or seven in number.

The question of opening the public schools, which had been closed for several weeks, was discussed. The argument in favor of the proposition was that children would be less exposed in school than when turned loose upon the street. This argument we supported, but only upon the condition that the Board should have knowledge of each case in the city, and that the superintendent of schools should be promptly notified of each case reported, and precautions taken to keep infected children and clothing from the schools. And furthermore, in consideration of the fact that a number of cases of diphtheria had already occurred, the location of which was not known, it was urged that it would be unsafe to open the schools until each house in which diphtheria had occurred had been found and thoroughly disinfected. Where the disease was still in progress, children from such houses were to be kept from school.

Acting upon this advice, the Board instructed the health officer to employ a competent assistant, and to hunt out each infected house in the city and thoroughly disinfect it.

It was further advised that a complete sanitary survey be made of the city, and all nuisances found, promptly abated.

Under the guidance of Dr. J. H. Goss, the following facts regarding the sewerage of Lancaster were learned: A considerable portion of Lancaster is located on a moderately high hill which slopes in all directions. On the east side two three-foot brick sewers were built a number of years ago, which receive storm water and also the drainage from a small number of houses connected with them.

These sewers pass under the State canal and discharge upon an open, marshy plain, about forty feet below the level of that portion of the city.

This marshy land is half a mile or more long, and about 300 yards in width, being bounded on the east by the Hocking river. The level of the river is above the level of this marsh, and consequently the discharge from the sewers and in addition, immense amounts of filth washed from the higher land of the city, is received into a basin having no outlet.

This condition of affairs has existed for many years, and a constant penalty is being paid for such an utter disregard of sanitary requirements.

The first ward of the city, containing about 2,000 inhabitants, is immediately west of this immense sewage catch basin, and I am assured by Dr. Goss, that at least two-thirds of all zymotic diseases occur among these 2,000 inhabitants, although the city contains more than 8,000 people.

In an epidemic of scarlet fever occurring several years ago, the first ward was especially afflicted. The present epidemic of diphtheria commenced in this ward, the first seven cases being confined to it. The disease, however, was soon spread over the entire city, but of the eleven deaths which had occurred up to November 18, seven, or nearly two-thirds, were inhabitants of this ward.

The immense supply of natural gas found at Lancaster, has already attracted to it a number of large industries, and the prospect for a rapid increase in its population is very bright. Already a number of dwellings are being built beyond the Hocking river—which is within the corporation limits of the city—and this pestilential spot bids fair to be soon inclosed with human habitations.

The authorities at Lancaster should not rest until the disgraceful conditions here described are entirely removed, for the natural advantages of the location of this fair city should make it one of the most healthful in our State.

The health officer has reported 59 cases and four deaths since my visit.

DIPHTHERIA AT THE SOLDIERS' AND SAILORS' ORPHANS' HOME AT XENIA.

On November 18, the papers announced an outbreak of diphtheria at the Orphans' Home at Xenia. I immediately wrote the Superintendent asking for a report of the situation and sent him copies of our circular on the Prevention of Diphtheria, offering also, any assistance our Board could give. He answered requesting me to come to the Home at once, which I did on the 20th.

There were about 900 children at the Home, ranging from three to sixteen years in age, and about 150 officers and employees.

In the latter part of November two boys were taken with diphtheria and died. These cases were supposed to have been traceable to the house

of a neighboring farmer whose child was suffering with diphtheria. The boys were said to have visited this house, but a careful investigation revealed that they had not been to the farmer's house although other children from the Home had been there. But as new children are being constantly received at the Home, and as most of the children leave each year to visit relatives and friends, it is not difficult to point out many ways in which an infectious disease might gain entrance to the Home.

For some time after the death of the two boys spoken of, no other cases appeared, but after this lull the disease again broke out, and scarlet fever also made its appearance, and from lack of proper hospital accommodation the majority of the children had already been exposed to one or other of these diseases. In all but two or three cottages, cases of diphtheria or scarlet fever had occurred, and as the hospital building was dangerously overcrowded, the sick children had been allowed to remain in their cottages for from several hours to a day or more in association with the well children.

On the evening of my arrival, in company with Drs. Galloway and Wilson, attending physicians, a number of cottages were visited, and four or five new cases of diphtheria and a number of cases of scarlet fever were found.

The hospital is a two-story brick building, constructed without the least reference to the necessary isolation of contagious diseases. The doors are loose and thin, and rooms open into each other so that every time a door is opened a current of air rushes out into the adjoining room. The rooms are heated by steam, the coils being placed in the rooms to be heated, and at our visit the temperature in one room, containing about forty patients, was 100°, while at the opposite end of the building the temperature in one room was about 60°.

I was informed that this could not be regulated. The only means of ventilation was by opening windows and doors.

The hospital was wretchedly overcrowded, diphtheria patients, scarlet fever patients and those having both diseases—of which there were many—being but imperfectly or not at all separated. Much more could be said in condemnation of this hospital which is entirely unfit for hospital purposes.

It is to be sincerely hoped that the experience the Home has just passed through will induce our legislators to make adequate provision for such outbreaks, which are peculiarly liable to occur at this institution.

The following measures for controlling the epidemic were recommended and at once carried out. They offer convincing evidence of the efficacy of isolation and disinfection in stamping out infectious diseases:

Two cottages were vacated, and all cases of scarlet fever were removed

to them on the night of the 20th. The hospital was set apart for diphtheria alone, and cases of this disease which we found in the cottages were at once taken to the hospital. Cases of scarlet fever were also removed from the occupied cottages and taken to those set apart for scarlet fever patients.

On the next day the Industrial Building was fitted up for a convalescent hospital for scarlet fever patients, and the cottages set apart for scarlet fever patients were given up to acute cases of this disease.

On Friday, the 22d, at 8 A. M., the well children were all sent to school. All the cottages were vacated, and each one of them was disinfected with sulphur fumes (three pounds of sulphur being burned for each 1,000 cubic feet of air space), and kept closed until 2:30 P. M., the children going from the general dining-room at dinner time back to school where they remained until 4:30 P. M. On the same night the general dining-room was also thoroughly disinfected.

School was then closed, and two school-rooms were fitted up for convalescent wards for male patients having scarlet fever.

Two school-rooms were also fitted up for quarantine wards for "suspects," and the matrons in charge of the cottages were instructed to examine their children twice daily, and to send all children having sore throat or symptoms of fever to these quarantine wards, to remain until the nature of their disease was determined.

Printed instructions were left for the disinfection of clothing, bedding, etc., of infected persons. Also in regard to dishes, glassware, cutlery, etc.

Remains of food were not to be placed with the general waste, but to be buried or burned, and dogs and cats about the premises were to be confined or killed.

On the appearance of a new case in any of the cottages, the cottage was to be immediately vacated and thoroughly fumigated.

These measures were faithfully carried out by Supt. Thomas and the attending physicians, and apparently with the happiest results.

We were again summoned to the Home on November 25th, for the purpose of quieting public alarm by publishing an official statement of the true conditions there, many sensational statements being in circulation at the time, which were the cause of alarm to thousands of interested people.

In company with Dr. Galloway, all the hospital wards and all buildings being used for such were inspected, and each patient more or less closely examined.

The following statement was sent to the Cincinnati *Commercial Gazette*, and was published in its issue of the 26th:

OHIO SOLDIERS' AND SAILORS' ORPHANS' HOME,
XENIA, OHIO, *November 25, 1889.*

To the Commercial Gazette, Cincinnati, O.:

I have just examined the conditions at the Orphans' Home at Xenia. The scarlet fever patients number 141, ninety of whom are convalescent. Of the others, not more than six are confined to bed. The disease is exceedingly mild, but one death having occurred from scarlet fever. There are thirty patients in the diphtheria hospital, most of them convalescent. There have been eight deaths from this disease. Every precaution is being taken to prevent further spread of these diseases, and the outlook at this time is most favorable. But four new cases of diphtheria since last Thursday. The entire number of children at the Home is 903.

C. O. PROBST,
Secretary State Board of Health.

Reports from the Home received November 29th, state that not a single case of diphtheria and but two or three of scarlet fever, have occurred since our visit on the 26th, and it is to be hoped that the epidemic has been stamped out.

The following letter was received from Supt. Thomas:

OHIO SOLDIERS' AND SAILORS' ORPHANS' HOME,
XENIA, OHIO, *December 28, 1889.*

C. O. Probst, M. D., Columbus, Ohio:

MY DEAR SIR: Yours of even date herewith, inquiring after the state of health at this institution, is before me. I mail to your address under another cover, a copy of yesterday's Xenia Daily Gazette, with marked editorial, which states our condition as it exists. We have had four deaths in the month of December. Thirteen deaths have resulted from the epidemic of diphtheria and scarlet fever since their prevalence here. We are in better shape than we have been at any time. Only four children are in bed from sickness, none seriously sick. We have opened up our work shops, and will issue our Home newspaper early in the coming week. The number of rooms occupied as hospitals outside of the hospital proper, have been reduced from eleven to four. We have had 101 cases of diphtheria, and 249 of scarlet fever or rash. We expect to be able in a few days to entirely abandon our convalescent wards outside of the hospital. This is our condition at present.

I am truly grateful for the interest you have in us.

Yours most truly,

NOAH THOMAS.

SMALL-POX AT DEUNQUAT.

November 26, a special from Tiffin reported small-pox near that city. I telegraphed the health officer of Tiffin for information. The following day the health officer of Upper Sandusky, Dr. Stutz, telegraphed me that small-pox existed near Upper Sandusky, and requested me to come at once. I met Dr. Stutz that night—the 27th—and the next day went with him to Deunquat, telegraphing the township trustees of that township to meet me there.

Three mild cases of varioloid were found, all in one family. Our visit was made on Friday. The following Sunday Dr. Stutz came to Columbus

to see me. The physician who had agreed to care for the patients had declined to see them, and the trustees had engaged Dr. Stutz to take the cases. He saw them Saturday night, and returning to Upper Sandusky Sunday morning, was met by the mayor, who informed him that the Board of Health of Upper Sandusky had had a meeting, and had decided that he would not be allowed to visit small-pox patients and return to Upper Sandusky. I addressed a communication to the Board of Health, stating that their action was unprecedented, and in my opinion, illegal. Also that Dr. Stutz had been directed to take such precautions as would minimize, if not destroy, all chances of danger. This letter was disregarded, and Dr Stutz was forced to remove to Deunquat, where with great difficulty, he found a vacant room, which he furnished for himself, and got a man to carry him provisions.

Another case developed in the same family while the doctor was in attendance, which died in a few days from hemorrhagic small-pox. There were five cases and two deaths in all, the disease being confined to the one family.

The following history of the outbreak appeared in the Record for November:

SMALL-POX AT DEUNQUAT.

An outbreak of small-pox has occurred at Deunquat, a small village in Wyandot county, on the T. & O. C. R'y.

The first patient was a babe ten months old in the family of J. J. Smith, a rag-picker, living in Deunquat.

This child was taken sick on Tuesday, November 12, Dr. Wert being called to the case on the following Thursday. On Saturday he pronounced it a case of small-pox and vaccinated Smith's family consisting of man and wife and four children, and a Miss Bunn and her child, who live with the Smith family.

This patient died on the 22d with what seems to have been—from the history given by Dr. Wert and the family—hemorrhagic small-pox.

Owing to some difficulty between the township trustees and the attending physician the latter ceased to visit the child on Monday, and as no other physician could be secured by the township trustees to see the case it was without medical attention from Monday until Friday night, when it died.

Many people in the neighborhood still refused to believe the disease to have been small-pox, but on Tuesday night a second child of Mr. Smith's was taken sick.

On Thursday morning, November 28, in company with Dr. O. C. Stutz, health officer of Upper Sandusky, we visited Deunquat and found all three of Smith's children suffering with varioloid. All the other inmates of the family were well.

Every endeavor was made to trace the origin of the first case, but nothing positive could be learned.

Mr. Smith has a wagon and rides over considerable territory in that part of the State collecting old rags. Although he denied the fact, it is pretty certain from other testimony, that he had gathered rags in the neighborhood of New Washington where small-pox occurred in several families a year ago.

The room he is living in was formerly used as a store-room for old rags, though it was emptied of these and cleaned last August.

The excitement in and around Deunquat was intense, and business was entirely suspended.

A meeting of the township trustees was called on Thursday afternoon, and they agreed to carry out the following measures :

Two guards were appointed to watch the house occupied by the patients, with instructions to prevent all persons from coming in or going out of the building. They were also to supply the inmates with food and other things required.

A physician was to be employed to care for the sick. Arrangements were made for this before we left. At the close of quarantine, all clothes, bedding, rags, etc., were to be burned, and the house disinfected under the direction of the attending physician.

All persons who had been directly exposed to small-pox were found and vaccinated, and general vaccination was advised.

The town is to remain free from quarantine restrictions so long as these instructions are carried out, unless the disease should break out in other houses.

The Township Clerk will notify us by telegram of all new cases which appear.

Health officers should be on the alert for the appearances of cases of this disease. We keep constantly on hand a small supply of fresh vaccine virus, which will only be used for vaccinating persons who have been *actually exposed to small-pox*.

Two weeks after the recovery of the patients, the house was fumigated by burning fifty pounds of sulphur, all clothing and bedding were burned, and also 1,000 pounds of old rags found in the cellar of the house.

SMALL-POX AT POINT PEELE ISLAND.

On October 16, a telegram was received from Mayor Hunt, of Sandusky, stating that small-pox prevailed extensively at Pelee Island, and asking for instructions. I telegraphed him: "Station police at landings, refuse all passengers and freight from Pelee Island without certificate from proper authorities; advise general vaccination; establish Board of Health." I also wired Dr. Bryce, of the Ontario Board of Health, requesting information as to conditions at the island. Dr. Bryce answered on the 17th inst. that the local health officer reported but one case on the island. Dr. Bryce's dispatch was given to the Associated Press, and I also notified Mayor Hunt and the health officers of the various lake towns of the situation.

October 19, Dr. Szendery telegraphed as follows:

SANDUSKY, O., October 19, 1889.

Dr. C. O. Probst, Secretary State Board of Health:

Fishing club sends Dr. A. J. Gawne and self to vaccinate Pelee Islanders. Can you send by wire and by mail recommendation or sanction to show Island officials immediately.

L. S. SZENDERY.

I sent the proper credentials, subject to the approval of the Island authorities.

Dr. Hodgetts, appointed Medical Superintendent of the Island by the Ontario Board of Health, kept me fully informed as to the conditions on the Island, enabling me to correct several sensational dispatches sent from Sandusky. Dr. Hodgetts complained that the authorities of Sandusky and Put-in-Bay (a board of health having been organized at the latter place on account of the scare) had refused to allow persons to land who came from Pelee Island, although no one was permitted to leave the Island without a certificate from Dr. Hodgetts. I instructed the authorities of Sandusky and Put-in-Bay to permit the landing of all persons from the Island provided with a certificate of freedom from infection, signed by Dr. Hodgetts.

No further trouble occurred, and the disease was not carried to our State. Six cases and one death from small-pox occurred on the Island.

TYPHOID FEVER AT CADIZ JUNCTION.

On December 9th. I went to Cadiz Junction in answer to a request from Dr. McGavran, of Cadiz, who stated that typhoid fever was prevailing there, several deaths having occurred.

Arriving at the Junction I was met by Dr. McGavran who informed me that he was obliged immediately to return to Cadiz. This left me without a guide, and I was unable to make an entirely satisfactory investigation. I found that there had been fourteen cases and four deaths from typhoid fever, up to the time of my visit, in a population of less than two hundred.

The first case in the village was that of a young lady who came home from Steubenville with typhoid fever. This was the first case of typhoid fever at the Junction for many years. The mother and sister of this patient contracted typhoid fever about ten days after her arrival, and about the same time several other cases occurred in the village. A well was in use at the home of the first case, but if their statements are to be relied upon, the stools of the patients at this house were disposed of in such a manner that there was no chance of polluting the well.

Four cases occurred in a house supplied by water from a reservoir used by the Pennsylvania R'y Co. This reservoir, and the springs that feed it, are carefully protected, being tightly closed, and the location of springs and reservoir is such that it is apparently impossible for the water to become polluted with infectious material.

TYPHOID FEVER AT DUBLIN.

An outbreak of typhoid fever occurred in the family of Mr. Corbin, a miller, living just outside the village of Dublin, a few miles north-west of

Columbus. The attending physician, Dr. Pinney, very urgently requested me to visit the family, which I did.

The family consisted of Mr. Corbin, wife and six children, ranging in age from six to twenty years. I found all of the children in bed with the disease.

The first case in the family was that of a boy about nine years old. It was learned that this boy had been on a visit to a small neighboring village, and while there had played with some children at a house where there was a case of typhoid fever. A week or more after returning home he became ill, but did not take to his bed for several days thereafter. Within two weeks a second case developed in the family, and the other children rapidly followed.

The point of special interest in the case is the probable pollution of the well through the intervention of an adjacent leaky cistern.

The well is at the kitchen door, protected by good curbing from surface washing. It is about seventy feet deep, dug through solid rock to the bed of the creek adjacent. Within twelve feet of the well, on a higher level, is a large cistern. The house, well and cistern are situated on the side of a steep hill, and the surface water readily finds its way into the cistern. Mr. Corbin informed me that he had noticed that after heavy rains the cistern would become full but would speedily become lowered to about two-thirds full. I suggested that it was probable that the boy first taken sick, before going to bed (and he was having diarrhoea at the time) would find a very convenient place to defecate under some trees, immediately above the cistern, and that rains that occurred at that time had washed the germs of typhoid into the cistern from whence they had filtered into the well, causing the second lot of cases. To show the condition of the cistern the following test was advised: A sample of water was taken from the well and Dr. Pinney was to take it to his office and there prepare a solution of nitrate of silver—of any strength—and with a dropper, drop this solution into a measured quantity of the well water until a distinct precipitate was produced, recording the number of drops taken to produce this effect. Then the cistern was to be filled with water and a barrel of salt was to be emptied into it. Samples of water from the well taken 8, 12, 24 and 48 hours after putting in the salt, were to be tested with the same solution and the same dropper, taking the same amount of the well water. Dr. Pinney wrote me some time after that the investigation had established beyond doubt that the well was being fed from the cistern, and that a large amount of filth was being washed into the well after each rain.

RULES OF THE STATE BOARD OF HEALTH.

The rules and regulations of the Board, adopted at the last meeting, were printed and copies sent to all local boards of health, to mayors of incorporated towns not having boards of health, and to all township clerks.

Quite a number of the latter have responded, showing a marked interest in the matter. Some of them have arranged with the physicians in their districts to report to them all cases of contagious diseases, and in return are sending reports of the same to this office. The question has been asked by many, Have we, as township trustees, authority to act as a local board of health? I am led to think by my experience with township trustees, and by the letters I have received, that many, if not most of them, would quite willingly take upon themselves the duties of a board of health, and I am of the opinion that it would be an excellent measure to secure a change of legislation, clothing township trustees with all the powers and duties of a local board of health, and making the township clerk the health officer. If, in addition, township trustees were required to enforce all rules of the State Board of Health, we would secure jurisdiction throughout the State.

The rules for the transportation of dead bodies were printed, and a copy sent to each general manager and general baggage agent of all railroads in Ohio, and one to each local board of health; many undertakers were also supplied with copies. The rules have been the subject of considerable correspondence. The question is specially raised as to who should furnish the blanks required—the State Board of Health, local boards of health, undertakers, or the railroad companies? The Adams Express Company informs me that two-thirds of all dead bodies shipped are sent by express without a person in charge. Some modification of these rules will therefore be required to ship bodies by express.

The Weekly Health Bulletin has been somewhat changed in character. The reports from physicians have decreased to a weekly average of about thirty, while a very considerable gain has been made in the number of reports received from health officers, 110 having reported last week. Hoping to still further increase the number the following circular letter was recently sent out:

STATE BOARD OF HEALTH,
SECRETARY'S OFFICE,

COLUMBUS, O., January, 1890.

To the Health Officer:

DEAR SIR: We sent you some time ago a copy of the Rules of the Ohio State Board of Health, and wish now to call your attention to the fact that we have failed to receive regular weekly reports from your Board, as required by these rules. Possibly the reason for this failure arises from the difficulty of obtaining from physicians reports

of cases of infectious diseases. This difficulty is one which can be overcome in the great majority of cases. A rule requiring physicians to report such diseases is now being enforced in a number of towns, large and small, and should be enforced in every town in the State having a Board of Health.

This can be legally done in the following manner :

1. The ordinance creating your Board should grant it power "to make such orders and regulations as it may deem necessary," and should fix a penalty for violation of these rules. (See Section 19 of Manual of Health Laws.)
2. The Board should adopt, among other rules, one requiring attending physicians to promptly report to the Board all cases of infectious diseases (naming the ones required to be reported).
3. These rules should be printed in pamphlet form, and distributed; or should be printed in some newspaper of general circulation.

With these provisions there can be no excuse, except neglect of duty, in getting prompt reports of infectious diseases. Physicians, with but few exceptions, recognize the necessity of, and willingly comply with these rules, and, when necessary, they can be enforced in the same manner that any ordinance of the city or village would be enforced.

We trust you will no longer neglect this important duty of a local Board of Health, and that you will take the proper steps to secure the desired reports from physicians and will send to this Board the weekly reports required.

I inclose blank cards for weekly reports of infectious diseases, and a report should be made not later than Saturday each week. Please send a card whether you have cases to report or not, as it is important to know where infectious diseases are *not* present. Notify us on the report card when a new supply of blanks are needed. Please write fully in regard to any difficulties you may have in securing such reports from physicians.

I desire, also, to call your attention to the monthly reports of deaths which are being made to the State Board of Health by a number of cities and villages of the State. These reports are published each month in the *Sanitary Record*, copies of which are sent you. It is highly desirable to make these reports of deaths as complete as possible, and if you have not been sending regular reports I trust you will now do so. Reports of deaths can be secured by enforcing a rule requiring undertakers to secure from the Board (or Health Officer usually), a permit to remove, either for interment or shipment, the bodies of all persons dying within the corporation. The undertaker should be required to secure from the attending physician a certificate of the cause of death. This rule is being enforced, without friction, in a number of cities and villages in the State.

I sent you, some time ago, "Rules Recommended for the Adoption of Local Boards of Health," which fully cover these points, and will send another copy if desired.

Postal blanks for monthly reports of deaths are furnished by our Board, and I enclose copies, hoping to receive reports from you hereafter.

Trusting you will give your hearty support to the enforcement of the Rules of the State Board of Health, I am,

Very respectfully,

C. O. PROBST, M. D., *Secretary.*

Nearly 200 answers were received from health officers in regard to the proposed joint meeting of the State Board of Health and representatives of the local boards. All but two or three were in favor of such a meeting, and I hope some action will be taken by the Board in regard to it. In the Province of Ontario a permanent organization of this kind has been effected, annual meetings being held; and I conceive that such an organ-

ization in Ohio might be made a most important means of securing better practical sanitary work in the various towns of the State.

The following circular letter was sent to the superintendents of the public schools of the larger cities of the State:

OHIO STATE BOARD OF HEALTH,
OFFICE OF THE SECRETARY,
COLUMBUS, O., *January, 8, 1890.*

To the Superintendent of Public Schools:

DEAR SIR: It has occurred to me that much good might be accomplished in the matter of school hygiene, by a joint meeting of the State Board of Health and the superintendents of our public schools. Members of your profession and members of our Board would doubtless furnish papers on subjects which would lead to profitable discussion by those present. I trust, however, that something more than a mere discussion of school hygiene would result. Among the many questions coming under this head, none is of more importance than the construction of school buildings, and the suggestions of the proposed conference may possibly take the form of legislative enactments, which will accomplish material good in this direction.

Many important questions in school hygiene will occur to you, and I have no doubt the proposed meeting could be made of interest and profit to all.

Our Board will hold regular meetings in April, June and September, and I hope we can secure the attendance of a goodly number of superintendents of public schools at one of these meetings, at which arrangements will be made for papers and discussions on school hygiene.

I would be glad to hear from you in regard to this proposed meeting—whether you favor it and would endeavor to attend. Also, please inform me which meeting, April, June or September, would best suit you.

Hoping you will join in this effort to improve the hygiene of our public schools, I am
Very respectfully,

C. O. PROBST, *Secretary.*

A large number of answers have been received, and the prospects for such a meeting are most flattering.

AMERICAN PUBLIC HEALTH ASSOCIATION.

I had the pleasure, as your Secretary, of attending the meeting of the American Public Health Association, held in Brooklyn in October.

The attendance was larger than usual, representatives being present from most of our States, and from many parts of Canada. It was noticeable, as showing the interest in public health, taken by the medical profession that fully nine-tenths of those present were physicians.

A resolution was adopted directing the Secretary to open a correspondence with the authorities of Mexico and Cuba, asking them to send representatives to meetings of the Associations.

Some very good papers were read, and the discussions following were, as a rule, instructive. It would occupy too much time to present even a brief abstract of the papers. Infant mortality and the prevention of

consumption were given special attention. Bearing on the former subject the following papers were read: The causes and prevention of infant mortality, by Dr. Jerome Walker, of Brooklyn; the causes of infant mortality, by Dr. R. O. Beard, of Minneapolis; the relations of the dwellings of the poor to infant mortality by Alfred F. White, C. E., of Brooklyn.

Dr. Walker made the statement that he was led to the conclusion that there had been but slight, if any, reduction of infant mortality in this country. He attributed the great mortality to improper food, including artificial feeding and improper dress, bad sanitary surroundings being also an important factor. His remedy was to teach parents how to properly care for their children, how to sterilize milk, and the value of cereal foods, and of a daily bath. Tent life was advocated for puny city children during the hot months.

Mr. Alfred White emphasized "the poorly constructed and badly arranged houses of the poor" as a prominent factor in infant mortality, especially the over-crowded tenement houses of large cities. In the discussions following these papers the importance of inspection and control of all dairies was given first place. Dr. Smith, Health Officer of New York City, made the somewhat startling statement that an investigation in that city had revealed the fact that infant mortality was less in the tenement houses than in the homes of the wealthy classes, and he attributed this to the fact that the children in the tenement houses spent a large part of their time out of doors, playing in streets and gutters, while the children of the upper classes were confined and coddled in their homes.

A committee of five, with Dr. Walker, of Brooklyn, as Chairman, was appointed to investigate and report on "The Causes and Prevention of Infant Mortality."

Several papers were read on the "Causes and Prevention of Consumption." The papers provoked considerable discussion in which it was shown that much opposition still exists to the contagion theory of tuberculosis. The following resolution was, however, unanimously adopted:

Resolved, That it is the sense of this Association, in the interest of the public health, that the community should be instructed that the destruction of the sputa of tuberculous patients is an absolutely essential part of the means of preventing the spread of pulmonary tuberculosis.

An interesting and enjoyable feature of the meeting was an inspection of the quarantine service of New York.

Dr. Henry B. Baker, of Michigan, was elected President of the Association, and Charleston, S. C., selected as the next meeting place.

Respectfully submitted.

C. O. PROBST, *Secretary*.

APRIL MEETING.

The State Board of Health met in regular session at its office in Columbus, April 25, 1890.

Present: Drs. Hoover, Sharp, Wise, Conklin and Prof. Nelson. The Secretary announced the absence of the President, Dr. Beckwith, on account of illness, and Dr. Anderson was chosen President *pro tem*.

Several letters from railroad companies were read in regard to the Board furnishing the blanks required by the Board's rules for the transportation of dead bodies. The Secretary was instructed to inform these companies that the Board could not furnish such blanks.

Invitations from Cleveland were read, inviting the Board to hold its next meeting in that city; also invitations to meet in Tiffin. The invitation from Tiffin was accepted, and the Secretary was instructed to arrange for holding a Sanitary Convention at the same time and place.

A communication from the Secretary of the Treasury was read relative to new rules of the Marine Hospital Service, for the prevention of the spread of infectious diseases.

Dr. Hoover, Chairman, presented a report of the committee appointed to investigate the sanitary condition of the Soldiers' and Sailors' Orphans' Home at Xenia. On motion, the report was adopted. The Secretary was delegated to represent the Board at the meeting of the National Conference of State Boards of Health to be held in Nashville, Tenn., May 19, 1890.

The following eulogy on the late Dr. W. H. Cretcher, member of the State Board of Health, was adopted:

WILLIAM H. CRETCHER, M. D.

BORN AT SPRING HILLS, OHIO, FEBRUARY 7, 1839.

DIED AT BELLEFONTAINE, OHIO, JANUARY 23, 1890.

It is very fitting that the State Board of Health, at its first meeting since the death of Dr. Cretcher, should place on its records a tribute of respect, and over his grave the laurel of friendship. Dr. Cretcher was endowed by nature with a commanding presence, a genial countenance and a very kindly disposition. He made friends rapidly and held them long and firmly. He added to his endowments by study, extensive reading and close thought. Though laying no claims to high or accurate scholarship, he had a broad culture and had acquired the faculty of expressing his thoughts clearly in very ornate sentences. Above all else he was a close student in his chosen profession—well versed in the standards of medicine, and especially conversant with its more modern and general literature. Feeling deeply the mighty responsibilities imposed upon him by his calling, he faced them fearlessly by giving to them his time, his thoughts, his life. He was therefore deservedly successful.

But it is of his connection with this Board that we wish to speak in a more particular manner. Appointed to the Board at its organization in May, 1886, he was the first President, and continued in membership until his lamented death, one week after our last meeting. He prized the work of the Board, gladly attended its meetings and took part in its proceedings. In all matters connected with State Hygiene he was intelligent, abreast of the times and filled with zeal. If he occupied little time in general debate, it was that his words might have more weight and his thoughts more influence. For the past two years his health has been giving away, nevertheless he was rarely absent from the meetings of the Board. He attended meetings often at great personal sacrifice, and with physical danger and discomfort. No one who saw him at the last meeting thought his end near, but it was so ordered, and we bow to the decree. Let us remember his virtues, forget his foibles, cherish his memory and honor his devotion to sanitary science by placing upon our own backs the burden he has laid down.

The epidemic at the Xenia Orphans' Home was discussed. On motion, the Secretary was instructed to take proper steps to have abated the nuisance arising from the slaughter-house located on the creek near the Home.

The Secretary was instructed to prepare a pamphlet on the powers and duties of local Boards of Health, and to procure legal aid in its preparation.

The Secretary presented the following quarterly report :

SECRETARY'S QUARTERLY REPORT.

Mr. President and Gentlemen :

Your Secretary begs to submit the following report :

Proof reading of the Fourth Annual Report was finished and 1,800 copies were received from the Supervisor of Public Printing ; 700 copies being given to the Secretary of State for the members of Legislature. About 1,400 copies have been distributed among health officers and members of local Boards of Health, physicians, newspapers and journals, State and city Boards of Health outside of Ohio, foreign health departments, and elsewhere.

Demands for back numbers of our Reports are becoming quite frequent.

The rules for the transportation of dead bodies, as modified for shipment by express, were printed and copies sent to all express companies in Ohio.

In January a letter was received from Dr. John B. Hamilton, of the Marine Hospital Service, asking this Board to appoint inspectors of immigrant vessels arriving at our Lake ports, for the purpose of aiding the National Government in preventing the introduction of leprosy into this country. Such inspectors will receive commissions from the United States Government, and have all the authority of United States inspectors.

By direction of Dr. Beckwith, the following persons were requested and consented to accept the appointment of inspector: Lorain, Dr. S. S. Cox, H. O. ; Cleveland, Dr. G. C. Ashmun, H. O. ; Sandusky, Dr. Szendery ; Fairport, Dr. A. L. Bennett ; Ashtabula, Dr. A. W. Hopkins, H. O.

The latter part of January Dr. Spencer, of the House of Representatives, introduced a joint resolution calling for the appointment of a committee of the House and Senate, and the Secretary of the State Board of Health, to investigate the sanitary condition of the Ohio Soldiers' and Sailors' Orphans' Home at Xenia. The resolution was referred to the standing committee on the Home, and the Chairman, after I had appeared

before the committee, reported back the resolution amended so as to place the investigation in the hands of a committee of the State Board of Health.

I notified Dr. Beckwith of the resolution and he appointed Dr. Hoover, Professor Nelson and the Secretary, members of this committee, with authority to inspect this and all other public buildings requiring sanitary inspection.

The committee visited the Home February 4th, and again on the 7th, remaining until the 9th. The Chairman will make a report.

I visited Zanesville for the purpose of learning the facts relating to the alleged introduction of diphtheria into that city through the medium of a corpse shipped from Chicago, and offer the following report:

DIPHThERIA AT ZANESVILLE, OHIO.

Ethel, the 13-year-old daughter of Mr. H. B. Tuttle, of Chicago, was taken sick November 19th with diphtheria, Dr. S. P. Hedges, of Chicago, being called to the case. The local symptoms were subsiding when, on December 6th, the child suddenly died on sitting up to drink a glass of milk.

Dr. Hedges made out a certificate of death for the health authorities, giving as the cause of death "diphtheria," and as the immediate cause of death "heart failure from blood poisoning (uræmic)."

"On the following day" says Dr. Hedges, "Mr. Tuttle called at my office and said that the Railroad Company would not transport the body of his child, as the box was marked "contagious," and with my certificate (or one like it) stating that the child died of diphtheria. He implored me to write a note, stating the immediate cause of death, and that these items in a letter would certainly enable him to secure the Railroad Company's favorable decision to accept the box for transportation. In haste, I wrote a few words to the effect that the child died of heart failure, after being really recovered from the disease proper. I have forgotten the wording of the note. This "note" could not be found. Dr. Hedges says that it was not nailed on the box.

In regard to the transit permit, Dr. Tomlinson, Registrar of Chicago, says: "The permit for shipment or for burial, was issued from Lake View, (Chicago,) and was all correct and according to law. I sent for the undertaker, who prepared the body, and he stated that the body was properly *embalmed* and in an *hermetically* sealed coffin, and he gave a certificate to the Railroad Company to that effect." "The permit of burial, or for shipment, stated as cause of death 'diphtheria,' and the records show the same. If any certificate of death accompanied the body, it was unknown to this office. Bodies are shipped upon a *permit*, and the certificate retained at this office.

The corpse was shipped from Chicago December 7, via the B. & O. R. R., and was received at Zanesville December 8.

Mr. Bernholtz, undertaker, took charge of the remains. On the box he found two papers, tacked one over the other. He did not read the papers, but Mr. Williams, who was assisting him read "Heart Failure" on the outer one. He is positive of this as he had an argument with one of the relatives of the deceased in regard to its meaning. The undertaker carried these papers to the health officer, Dr. Sutton, who hastily read one of them just before being called away. While away his office was put to rights and these papers, unfortunately, burned. Dr. Sutton claims a vivid remembrance of the words "Heart Failure," "Blood Poisoning" and the name "Dr. Hedges."

The corpse was taken to the house of Mr. Gibbons, a brother-in-law of Mrs. Tuttle, on the night of its arrival, and was accompanied by Mr. and Mrs. Tuttle and four of their children.

Mrs. Tuttle insisted on having the coffin opened, and this was done. No trustworthy information could be gained as to who were in the room when the corpse was exposed, except that the Tuttle children were not there. The corpse was embalmed and prepared in the ordinary way (not wrapped in a sheet) and the coffin was enclosed in a pine box lined with zinc sealed with rubber joints—so says the undertaker. Some flowers inclosed in the coffin, were taken out and photographed.

Two of the Tuttle children, after the funeral, were taken to their aunt's, a Mrs. Parsons.

The Tuttle child was buried on the 10th, and on the following day Dr. Kennedy was called to see the Tuttle children at Mr. Gibbons'. He found both children and the mother suffering with diphtheria. On the 13th, one of the Tuttle children that had been at Mrs. Parsons', was brought sick to Mr. Gibbons', and was found to have diphtheria, and on the following day the second child was brought from there suffering with the same disease.

About six days from the time the Tuttle children at Mr. Gibbons' were taken sick, diphtheria appeared in the Gibbons family, and about the same time the only child of Mrs. Parsons, with whom two of the Tuttle children were staying when they were taken sick, developed diphtheria. A son of Mr. Gibbons' left home to escape the disease, and went to a sister, Mrs. Shean. He was taken sick about ten days after leaving home, and Mr. and Mrs. Shean and one child contracted the disease from him. A child of Mrs. Hollsman, the mother of Mrs. Tuttle, who had played with the Tuttle children who were staying at Mrs. Parsons', also took diphtheria; and his brother, who nursed him, contracted the disease from him.

Two Tuttle children, a child of Mrs. Parsons and a child of Mrs.

Hollsmann died, making four deaths and sixteen cases directly traceable to the Tuttle children.

Dr. Kennedy informs me that Mrs. Tuttle told him that she took her children in to see their dead sister soon after she died (this was in Chicago), and that they were permitted to kiss the corpse. This was on the 6th of December. The corpse was exposed in Zanesville on the 8th and 9th. On the 11th two of the Tuttle children and the mother were taken with diphtheria, five days from their exposure in Chicago, and between two and three days from their exposure in Zanesville.

The probabilities are that the disease was contracted in Chicago, though this can not be definitely settled.

The records of the health office of Zanesville show that five cases of diphtheria, and three deaths occurred in Zanesville *prior* to the arrival of the Tuttle family.

In addition to the sixteen cases directly traceable to the corpse of the Tuttle child (Ethel), there have been in Zanesville since its arrival Dec. 8, to the time of my visit March 31, forty-three cases and thirteen deaths. The most minute inquiry failed to establish any certain connection between these cases and the sixteen already given.

The disease was extremely malignant in the family of Mr. McGregor. There were eight children, father, mother and grandfather in this family; all but two children had diphtheria, and all died except one child and the grandfather, seven deaths in all.

The McGregor house is a comparatively new one, situated near the base of a hill on which is a cemetery. Several children that had died of diphtheria were buried in this cemetery during the two months prior to the outbreak in the McGregor family.

The house was found in fair sanitary condition; cellar dry and clean, and the house freely exposed to the air.

The soil is, for six or seven feet, brick clay mixed with sand and gravel, overlaying a sand and gravel bed thirty feet or more in thickness.

The McGregor well is a drove well 38 feet deep, situated a few feet in the rear of the house. The privy is situated about 75 feet from the well.

An interesting fact is in regard to the reported condition of an open well located about 400 feet from the drove well. This open well was not used, and during last summer it was noticed to emit a very foul odor. It was baled out and thoroughly cleaned—the water smelling most offensively—but nothing was found to account for the bad odor. It subsequently refilled with water, and continued to smell badly until the advent of cold weather. Was this due to drainage from the cemetery? The soil at the cemetery is gravel underlaid with clay or sand rock, and the graves are often full of water. The drainage is towards the McGregor house, one

or two springs cropping out at the base of the hill. A pike road and a deep gutter intervene between the hill and the McGregor house.

Nine families in which there were children, used water from the McGregor well (the drove well) and in none except the McGregor family did diphtheria occur.

Samples of water were procured from the open well and from the drove well, and were submitted to Prof. Howard for analysis, with the following results:

STARLING MEDICAL COLLEGE,
COLUMBUS, April 19, 1890.

C. O. Probst, M. D., Secretary Ohio State Board of Health:

DEAR SIR: The samples of water received from Zanesville have been submitted to a sanitary examination by me with the following results:

Mark.	Parts per 100,000.					
	Oxygen required.	Free Ammonia.	Albuminoid Ammonia.	Nitrous acid.	Chlorine.	Total solids.
"A" (drove well).	.09	.004	.012	trace.	.57	24.6
"B" (open well).	.19	.014	.013	.004	.43	18.6

From the results of this examination alone, and without any knowledge of the source of the water, and assuming that the samples are from wells, it may be concluded that "A" is a water of fair quality for a well water. The albuminoid ammonia is a little high but the water can not be pronounced a polluted one from these data.

In "B" the oxygen required, free ammonia and nitrous acid, are so high as to justify the analyst in pronouncing the water an impure one, and one that, judging by these results alone, he would be justified in condemning. The fact that the chlorine in both these is as low as it is found would indicate that the source of the impurity is not vault contents, and the considerable quantity of oxidizable and nitrogenous matter found in "B," without being able to refer it to a convenient vault, would stimulate an inquiry as to what the real source of the contamination may be.

It is proper to state that a full knowledge of the surroundings of the sources of these waters might modify these conclusions somewhat, and these are presented rather for the sake of indicating what a chemical analysis alone will reveal, rather than for the purpose of giving a final verdict on the qualities of these waters.

Respectfully submitted.

CURTIS C. HOWARD.

The McGregor house is within two squares of the Gibbons house, but it was impossible to learn of communication between any member of the McGregor family, and any other family in which there was diphtheria, nor of any article of clothing, books, etc., that could have carried the disease.

A report was current that the first case in the McGregor family was contracted at the Putnam Seminary, an institution of Zanesville. The only foundation for this report was the fact that several of the girls at the college had sore throat, and that one case seen by a physician, who was visiting his daughter, was pronounced by him a case of sore throat with a

diphtheritic tendency. Of several other cases occurring at this school, there seemed no question as to their being cases of simple sore throat.

The outbreak has had the effect of making all persons in Zanesville very careful in regard to this disease, and physicians, undertakers and parents now willingly obey the rules of the health office, there having been considerable difficulty in this respect heretofore.

Acting under instructions received at the last meeting, arrangements have been completed to hold a joint meeting with the Superintendents of Public Schools. The program was printed in the *Record*, and other programs were sent to the superintendents of schools in all towns of over 500 inhabitants. The Franklin County Teachers' Association, whose monthly meeting falls on the 26th, has arranged to attend our meeting on that day.

A number of important communications from health officers and others have been received and answered. Legal questions are very frequently referred to this Board, and the Attorney-General is not willing to answer these, rightly making the distinction that he is the legal advisor of the State Board and not the local boards of health. Mr. Hunter, of Warren, has virtually declined to furnish the pamphlet on health laws which he promised, and I would again urge the importance of having a printed document specifically setting forth the powers and duties of local boards of health. Alone, I am not qualified to prepare this, and would suggest that I be authorized to employ legal aid in the preparation of such a document. Such questions as abating nuisances, and the different legal processes required in different kinds of nuisances, enforcing rules for reports of infectious diseases, and the collection of statistics, establishing quarantine, establishing drains and sewers, regulating the construction of privy vaults, rights to employ sanitary policemen and contract debts; these and many other questions are being constantly referred to this office. The statutes offer an insufficient guide to most health officers, which is not strange when lawyers themselves require explanatory treatises to understand them.

The sixth annual meeting of the Conference of State Boards will be held in Nashville, May 19th. I have submitted the following proposition from Ohio for discussion: Should State Boards of Health have executive powers?

On January 23d, at 3 p. m., Dr. W. H. Cretcher, then a member of the State Board of Health, died at his home in Bellefontaine.

A committee of the Board, consisting of Prof. Nelson, Dr. Wise and your Secretary, attended his burial and assisted in the funeral ceremonies.

A committee, of which Prof. Nelson is chairman, has been appointed to present at this meeting suitable resolutions in regard to his death.

The Board adjourned to the Universalist Church to meet with the Superintendents of Public Schools, where the following program was given :

Program.

FIRST SESSION.

FRIDAY, APRIL 25, 1:30 P. M., STANDARD.

1. What is the State Doing to Promote the Sanitary Interests of our School Children?
Dr. John Hancock, State Commissioner Common Schools.
 2. Should our State Universities Establish a Course of Hygiene and Sanitary Engineering?
Prof. N. S. Townshend, Ohio State University.
 3. Should a Person with Consumption be Allowed to teach School?
Dr. S. P. Wise, member State Board of Health, Millersburg.
 4. The use of Natural Gas in the Public Schools.
Prof. George Welsh, Sup't Public Schools, Lancaster.
 5. How may School Children be Protected from the Dangers of Fire?
W. Z. McDonald, Chief Inspector Workshops and Factories.
 6. How may the Impurities of the Atmosphere be Measured (illustrated)?
C. C. Howard, M. Sc., Columbus.
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SECOND SESSION.

FRIDAY, 7 P. M., STANDARD.

1. Requirements of a Model School Building.
Prof. W. H. Compton, Sup't Public Schools, Toledo.
2. What Should be the Location of School Buildings?
Prof. Edward Orton, Ohio State University.
3. Should all Children be Vaccinated before Admission to the Public Schools?
Dr. Thos. C. Hoover, member State Board of Health, Columbus.
4. How Should Buildings be Constructed and Rooms Arranged as to Size, Position of Windows, Coloring, etc., to Secure Proper Lighting of School Rooms?
Dr. H. P. Allen, Columbus.
5. Physical Culture in the Public Schools.
Dr. H. J. Sharp, member State Board of Health, London.

THIRD SESSION.

SATURDAY, APRIL 26, 8:30 A. M. STANDARD.

1. Should Pupils be Required to Study out of School Hours?
Prof. L. W. Day, Sup't Public Schools, Cleveland.
Dr. Starling Loving, Columbus.
 2. Should School Examinations be Abandoned?
Dr. J. F. Baldwin, Columbus.
 3. How Should School Rooms be Seated for Health and Comfort?
Prof. W. Knott, Sup't Public Schools, Tiffin.
 4. Should the State Regulate the Sanitary Requirements of School Buildings Hereafter Erected?
E. T. Nelson, M. A. Ph. D., member State Board of Health, Delaware.
 5. The Ventilation of old School Rooms.
J. W. Yost, Architect, Columbus.
 6. How may School Children be Protected from Contagious Diseases?
Dr. C. O. Probst, Secretary State Board Health.
- Volunteer papers. Adjournment.
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JUNE MEETING.

The State Board of Health met in regular session at the Shawan House, Tiffin, Ohio, June 25, 1890.

Present: Drs. Beckwith, Wise and Conklin, and Prof. Nelson.

The local Board of Health furnished carriages and escorted the Board around the city, showing them the water-works, sewerage, the cemetery and other points of sanitary interest. At 8. p. m. the Board proceeded to Shawan's Opera House where a public meeting was held, the following program being given:

Program.

WEDNESDAY, JUNE 25, 1890, AT 8 P. M.

1. Address of Welcome.
Hon. J. F. E. Fanning, M. D., Mayor, Tiffin.
2. Response.
D. H. Beckwith, M. D., President State Board of Health, Cleveland.
3. Water and its Purification.
H. H. Noble, M. D., Tiffin.

4. The Water Supply of Tiffin.

W. A. Dickey, M. D., Tiffin.

DISCUSSION.

5. Consumption and its Prevention.

S. P. Wise, M. D., member State Board of Health, Millersburg.

DISCUSSION.

6. Legal Powers of Boards of Health.

Hon. P. M. Adams, Tiffin.

DISCUSSION.

Adjournment.

The Board met at the Shawan House at 9 A. M. of the 26th.

Present, as before, Dr. Beckwith in the chair.

The minutes of the last meeting were read and amended so as to include the program of the joint meeting of the Board and Superintendents of Public Schools. The Secretary presented his quarterly report, which was approved as read, and ordered filed for publication. Prof. Nelson spoke of cases of meat poisoning occurring in his father's family. The meat was cooked and some of it eaten on Friday with no bad effect, but the next day several eating of what remained were seized with symptoms of ptomaine poisoning. Prof. Nelson suggested that cheese might possibly act in the same manner—good to-day but poisonous to-morrow. Cheese poisoning was further discussed by members present. The Secretary reported that the health officer of DeGraff had stopped the sale of cheese made by Mr. McCracken until further orders from the State Board of Health. On motion, the Secretary was instructed to visit the factory in question and take such action as appeared justifiable. The Secretary was instructed to arrange for a joint meeting of the Board and representatives of local Boards of Health, to be held in September or January, as might be deemed most advisable. It was decided to allow the slaughter house, near the Xenia Orphans' Home, inspected by the Secretary, to remain so long as it was kept in the manner agreed upon. On motion, a committee consisting of Prof. Nelson, Dr. Wise and Dr. Conklin, was appointed to confer with the officers of the State Teachers' Association, and arrange to have a day set apart at their next annual meeting for a joint meeting with the State Board of Health. A petition from a number of citizens of Frazeysburg was read, petitioning the Board to aid them in securing drainage for their village. The Secretary was instructed to visit Frazeysburg and render any assistance possible.

The election of President for the ensuing year was announced. A ballot being taken, Dr. Thomas C. Hoover received the unanimous vote of the Board for President, and was declared elected, to take his seat in September.

It was voted to pay Miss Tipton \$25 for reporting the proceedings of the meeting of the Board and Superintendents of Public Schools, and the Secretary was instructed to accompany a voucher for this amount with a letter of thanks for her services.

Mr. Campbell, Secretary of the Fostoria Board of Health, and Mr. Hess, Health Officer, were introduced to the Board, and made statements in regard to water-works being constructed in that city, and other matters connected with its sanitation. They requested that a representative of the State Board be sent to Fostoria to consult with the local Board. The Secretary was instructed to go the following day.

The question of Tiffin's water supply was discussed, and Dr. Noble, formerly health officer of Tiffin being present, was invited to take part. The Secretary was requested to inspect a well of a tenement house, a recess being taken pending his report. The Board being called to order, the Secretary reported in regard to the well at the tenement house, and also another well to which his attention had been directed. He was instructed to call the attention of the health officer of Tiffin to the matter.

Professor Nelson presented the following report on Tiffin's water supply:

We find every thing about the works in good order, and are greatly pleased with the appearance of the property and the care that is taken of it. The water supply is from a mill race fed from the Sandusky river. The race is of the usual character—muddy sides and bed, and largely over-grown with plants and weeds. We found dead vegetable matter floating in it, and the water must contain a high percentage of organic matter. From the race the water enters a settling vat, where, in theory, it is purified in part. Thence it passes through a filtering wall into a second vat. Investigation failed to show any special improvement in the water that had passed through these several chambers, and it enters the pipes over-loaded with mud and other impurities. It would hardly be improper to compare it with the famous Ohio river water as seen at Cincinnati.

It may be urged that the present stage of the Sandusky river, owing to recent and long-continued rains, is not such as to give a perfectly fair opinion of the local water supply. The water certainly contains more mud and sediment than during the late summer and fall, but the present occasion affords a most favorable opportunity for testing the system of filtration. This we unqualifiedly condemn. The water as furnished this week to the citizens of Tiffin, is entirely unfitted for any domestic use, not to speak of it for purposes of drinking or cooking. Judged by the amount of sediment, it is one of the poorest water supplies furnished any city in the State.

Some perfect system of filtration should be introduced at once. We are by no means satisfied with the source from which the supply of water is obtained. If the question of locating water-works was before us, we should condemn the Sandusky river, and advise the people of Tiffin to look elsewhere. The river above the works passes through a farming country. Houses and barns are to be found on its banks, and the debris in many cases naturally flows towards the river. This will always be a source of danger. Two sources of possible water supply are open. The number of oil, gas and other wells that have been sunk through the strata show that there is here a large if not an abundant supply of water sufficiently deep beneath the strata to be free from surface drainage.

Then again we are informed that this county abounds in springs. That two miles south of the city, one of these springs, the Mohawk, is of large size. That is a source of water supply that might well be investigated.

At 2 P. M. the Board proceeded to the opera house, where the second public session was held, the following program being given :

SECOND SESSION.

THURSDAY, 2 P. M.

1. Knowledge in Relation to Sanitation,
J. Bridinger, M. D., Health Officer, Tiffin.

DISCUSSION.

2. Sanitation in the Home,
Maud Abbott, M. D., Tiffin.
3. Cleanliness : Its relation to Godliness,
Rev. D. D. Brigger, Tiffin.

DISCUSSION.

4. Cholera Infantum ; Its Cause and Prevention,
G. P. Willard, M. D., Tiffin.

DISCUSSION.

5. The Prevention of Contagious Diseases,
J. F. E. Fanning, M. D., Tiffin.

DISCUSSION.

ADJOURNMENT.

There being no further business, the Board adjourned.

SECRETARY'S QUARTERLY REPORT.

Mr. President and Members of the Board:

I have the honor to present the following report:

Pursuant to instructions I visited Xenia and called on the owners of the slaughter-house situated near the Ohio Soldiers' and Sailors' Orphans' Home. It is owned by Marshall Bros., of Xenia, who lease the land upon which the slaughter-house is located.

The Marshall Bros. agreed to carry out the following measures until the matter could be again brought before the board: All hogs kept at the slaughter-house were to be removed and no others were to be brought there except for immediate slaughter. The house and surrounding grounds were to be thoroughly cleaned and treated with disinfectants, and all offal was to be received in carts and removed daily. No impurities of any kind were to be allowed to enter the creek.

I have had two letters from the Health Officer of Xenia, who has been watching the matter for me, and he informs me that these measures are being faithfully carried out.

While at Xenia I visited the Orphans' Home and was pleased to note the number of improvements that were being made. New plumbing will be placed in all cottages; the over-crowding has been considerably reduced, and the Superintendent informed me that all the recommendations of the Board would be carried out. A new water supply will be secured, and this will greatly lessen, if not entirely remove all danger from the slaughter-house of the Marshall Bros.

INVESTIGATION OF LOGAN'S SCHOOL-HOUSE.

At the invitation of the Superintendent of public schools and School Board of Logan, I visited that place and made an inspection of their public school building. The following is a copy of the report transmitted to the School Board of Logan:

To the School Board of Logan, O.:

GENTLEMEN—On May 15, at the request of your Superintendent of public schools, I made an investigation of your public school building, and found there the following conditions:

The building is an old structure, erected in 1861, built of brick, of box shape, three stories high in addition to the basement. Originally the upper floor was an undivided hall, but many years ago it became necessary to divide it into four school-rooms, and, this not sufficing, two school-rooms were fitted up in the basement. At the present time there are fifteen schools and fourteen school-rooms (one class and teacher being obliged to occupy a cloak-room), and an enrollment of 780 pupils, with an average attendance of 94 per cent.

The rooms are all heated with stoves, one or two being placed in each room. It is unnecessary to say that such a method of heating school-rooms is always unsatisfactory, those near the stoves suffering with heat, while in cold weather those in a distant part of the room are constantly complaining of cold.

There are no provisions for ventilating any of the rooms; a small amount of air is taken from the rooms by the stoves, and doors and windows, in mild weather also afford some relief from foul air. On the day of my visit the air out of doors was quite warm and fires were not burning. The windows were wide open, but in spite of this nearly all of the rooms had a bad odor, exceedingly unpleasant on coming in from the open air. This odor affords a fair test of ventilation, and no room is fit for occupancy in which it can be detected. If the air of your school-rooms is impure with windows open, what must be its condition when these are kept closed? The foul atmosphere of these rooms is in part due to their overcrowded condition. The first C primary room is 30'x22'x13', equal to 8,580 cubic feet of air space. There are 30 pupils in this room, which allows but about 107 cubic feet of air space for each scholar. The first D primary room—in the basement—is 29'x21'x8'5'', equal to 5,176 cubic feet of air space. With 50 pupils in this room there is a cubic air space per capita of about 103. Other rooms are somewhat less crowded, but as each child at the minimum should have not less than from four to five hundred cubic feet of air space, it will be seen that your schools are very much over-crowded. I need not state that such over-crowding in unventilated rooms is highly prejudicial to health, and also affords favorable conditions for the propagation of contagious diseases should they once be introduced into the schools.

The lighting of many of the school rooms is very bad. In some rooms the light is directly in front—the worst possible arrangement; in quite a number it is from the right and rear instead of left and rear as it should be. In many of the rooms the black-boards are placed between the windows, and to make matters worse, they are finished with a reflecting surface, making it impossible in many points of the room to see work on the board. There is probably a sufficient amount of light admitted to all the rooms, except those in the basement, but in many of them it comes from the wrong direction. The basement rooms are little better than cellars and in every respect are unfit for occupancy. They are lighted (?) by four small windows 30x32 inches, and the rooms are dark even on bright sunny days. One room is 36 feet long, and, although the sun was shining brightly, it was with the greatest difficulty that work on the front black-board could be read from the rear seats. The teacher informed me that on dark days it was quite impossible to see work on this board, and she was in the habit of having a bright fire burning in the stove, which stands near the end black-board, and then opening the stove door so the scholars could see by the fire-light. The youngest pupils occupy these rooms and they are given daily exercises to copy on their slates from the black-boards; these exercises, moreover, I noticed, were written in a comparatively small hand.

The floors in these rooms are laid on two-inch scantling placed directly on the ground, the flooring in some places resting on the earth. The teacher informed me that the rooms were always damp, and that at times the water actually oozed through the cracks in the flooring. The flooring in one place was partially removed. The earth was found damp and moldy, with an unpleasant odor. There is no provision for the circulation of air under the floors.

There is still another danger to these basement rooms, and indeed to all the rooms in the building. Directly across the street from the school building, less than one hun-

dred feet away, is an old grave yard, still occasionally used. The soil in this locality is quite loose and porous, and in the winter, when the basement of the school-house is heated, it is at least possible that gases from this graveyard will be drawn into the school building.

About 200 pupils are sent to the third—or counting the basement—to the fourth floor. The exit from this floor is by two narrow half stairways to a small landing, and from this landing to a hall on the next floor below by a stairway four and a half feet wide. The hall is ten feet wide, and two rooms with over 100 pupils also have exit into this hall.

Such, briefly, are the conditions found in your public schools, and the changes required will readily suggest themselves.

The basement rooms should be at once and permanently abandoned. To confine children in such rooms is not justifiable under any circumstances.

The entire basement floor should be laid in cement or asphalt so as to cut off all moisture and air from the earth. On account of the proximity of the cemetery this is highly desirable.

It would also be well to abandon the upper floor for class rooms. Excessive stair climbing is required to reach them—this is specially injurious to girls approaching puberty—and, with the present means of exit, a fire in the building would jeopardize a large number of lives. If this floor is not abandoned, properly constructed fire escapes should be provided.

Some means should be taken to properly heat and ventilate the school rooms.

The seats in such rooms as have the light coming from the wrong direction, should, where possible, be changed so as to bring the light from the left and rear of the pupils.

All black-boards between windows should be abandoned, and the surfaces of the others should be of a dead black finish.

The overcrowding should be relieved, and not more than forty pupils, at most, be allowed in any one room of the present building.

The site of the school building—except for its proximity to the cemetery—is most favorable for health. The well is far removed from all sources of contamination, and an excellently large play ground is provided. The privies, while in as good condition as possible, are necessarily a nuisance, and it would be better in many respects to substitute dry earth closets.

Trusting to have made clear the necessity for the changes recommended in this report,

I am, very respectfully,

C. O. PROBST, M. D., *Secretary.*

The following letter was received from the Superintendent of Logan's public schools:

LOGAN, OHIO, *June 20, 1890.*

Dr. Probst:

MY DEAR SIR: Your report was duly received, and I should have written to you sooner, but I have been waiting developments. The papers published the reports this week and the Board of Education has called a meeting for next Monday evening to discuss the question of building. The people seem to be thoroughly aroused on this question. I am glad that I had you come and make this examination. Have you any new ideas to offer?

Very truly,

R. E. RAYMAN.

Since the above was written arrangements have been completed to build a new school house in Logan.

INSPECTION OF THE CHILDREN'S HOME AT WILMINGTON.

The Superintendent of the Children's Home at Wilmington requested the Board to make an investigation of that institution. Dr. Hoover and myself visited the Home, and on returning, transmitted the following report to the county commissioners :

COLUMBUS, OHIO, May 8, 1890.

To the Commissioners of Clinton county, Wilmington, Ohio :

GENTLEMEN: On May 7th, by invitation of the Superintendent and Board of Trustees, we made an inspection of the Children's Home of your county, and found there the following conditions :

The Home consists of a farm of 50 acres, with a brick house of ten rooms, built for a dwelling house, to which has been added two cheap frame structures. A very excellent stable has lately been erected. The building is well located, and while not erected with special reference for the purpose for which it is now used, could be readily adapted, by certain changes, for a Children's Home.

We found thirty-nine children at the Home, ranging in age from two to fourteen years. With one or two exceptions they presented the appearance of being in good health, and were evidently well cared for. And we desire to take this opportunity to compliment the present management of the Home for having accomplished so much more than could reasonably have been expected under the difficulties with which they have had to contend. We are informed that since the institution was opened, five years ago, 199 children have been received, and about 150 of these have been placed in good homes where they will have opportunities of becoming good and useful citizens. Every thing about the place was extremely clean and tidy, and apparently every thing possible is being done for the children. Some things about the Home, however, must be severely condemned. We find that the sleeping accommodations are entirely inadequate, and that the children are overcrowded to a most dangerous degree. At the present time fifteen children are being confined at night in a room fourteen by eighteen feet, a room originally intended for two people, which allows an air space for each child of about 150 cubic feet. There is no way of ventilating this room except by the windows. Eight children would be as many as could safely occupy this room. There are two dormitories of this size, and one over the school room somewhat smaller. As many as sixty-six children, in addition to the care-takers, have had to be accommodated in these three sleeping rooms, and this many or more may at any time be forced upon the institution. There is absolutely no provision for taking care of sick children, and no way by which a child taken with a contagious disease could be separated from its companions. At this time one of the inmates is affected with consumption, and as the highest authorities are now agreed that consumption is communicable, the health of the other children is daily jeopardized by compelling them to sleep in the room with this person. It is impossible to maintain a high standard of health among children so situated, and with the present overcrowded condition, the introduction of such a disease as small-pox or diphtheria would inevitably result in great loss of life.

We feel assured that it will only be necessary to call your attention to existing conditions to secure the proper remedies, and the only remedy to be seriously considered is the erection of additional buildings of sufficient capacity to relieve the present overcrowded condition and meet the growing demands of this very worthy institution. There should be no delay in making these changes, and notice is hereby given you that the State Board of Health will require you to remedy the injurious conditions its undersigned committee has pointed out.

(Signed,)

THOS. C. HOOVER,
C. O. PROBST,
Committee.

DIPHTHERIA AT LIMA.

An outbreak of diphtheria recently occurred at Lima, and the first fatal case was given a public church funeral before the health officer had notice of the case. The Lima Republican of June 21st, containing the following article on the situation, was sent me by the editor with a letter urging me to come to Lima at once:

The Republican, several mornings ago, contained an article calling the attention of the public to the fact that the Board of Health was negligent in enforcing the sanitary laws, and was not doing what should be done to make Lima a healthful city and less liable to contagious disease. The article was brought out by the presence of the diphtheria epidemic and the filthy condition generally of our city.

The Board continues to neglect its duty and the Republican, this morning, will cite a few cases which the Board must surely have seen and noticed, but neglected for some cause unknown, to remedy the evil.

The first case is that of the principal thoroughfare of our city—Main street. From one end of the street to the other a horrible state of affairs exist. The accumulations from store-rooms are swept into the gutter to lie there and rot. Stagnant water fills some parts of the gutters. The public square is a mass of filthy accumulations. It is a sickening sight, and the poisonous gasses which emanate during the heated term are awful. The streets are not alone in their horrible condition—the alleys are the same.

A reporter for the Republican made a tour—or rather attempted a tour of some of the principal ones but was driven from his journey, the stench in some places being almost unbearable. The reader may not believe it, but it is true, nevertheless, that the yards and alleys in the rear of some of the business houses and hotels of Lima could not be in a worse condition. Can it be that these places have not been reported to the Board of Health? We can safely say that they have, for one of the sanitary policemen told the writer only a day or so ago that he had reported a large number of cases to the Board, but they had neglected to take any action in the matter.

The residence portion of Lima, to a certain extent, compares very favorably with the condition of affairs already cited.

There is a case of diphtheria at Adam Lowry's, on West High street, and last evening another child in the same family had symptoms of the disease. Near Mr. Lowry's home is a nuisance which has been repeatedly reported, but nothing has been done to abate it. Notice, it seems, has no effect on the property owners. The sanitary police can have arrests made for violating their orders. Can it be that they do not understand their duties? If not, let them be instructed. Make examples of a few men and let them understand that they must clean their premises and keep them so.

The Board of Health is not doing its duty. It is not enforcing the laws. We believe the State Secretary, however, has been notified they are.

The sanitary condition of Lima is such that it demands immediate attention. The Republican has cited a few cases for the Board to work upon, and will continue to do so, unless they arouse themselves and do their duty.

I visited Lima a few days later and found that the newspaper article had greatly exaggerated the situation, although it appeared that a considerable amount of cleaning had been done just prior to my visit. I was driven over the city, accompanied by the members of the Board of Health and health officer, and also made a number of independent excursions into the side streets and alleys. I found the city in an average sanitary

condition—not as it should be, but no worse than the majority of cities of that size.

The Board was, undoubtedly, unprepared and failed to enforce vigorous measures at the first of the outbreak. At the present time cases are being more promptly reported, houses are placarded and some attention is being given to disinfection. As a result, the disease seems to be under control, no new cases having been reported during the two days prior to my visit.

The disease was brought into the town last April, a woman and her child coming there from Cincinnati and dying with diphtheria shortly after their arrival. May 15th another case occurred, and two weeks later six cases and four deaths occurred within two days. These cases were all in the same district and were directly traceable to contagion. The disease then spread to other parts of the city, and at the time of my visit there had been twenty-five cases and six deaths.

The proceedings of the meeting of the Board and Superintendents of Public Schools were published in the Sanitary Record, saving, thereby, about thirty-five dollars in postage. Copies were sent to all Superintendents of Public Schools in towns of over 300 inhabitants, to all local Boards of Health in Ohio, to all State Boards of Health and to various other boards and persons.

In company with Dr. Hoover, of the Board, I attended the meeting of the National Conference of State Boards of Health, held at Nashville, Tenn. I was re-elected Secretary of the Conference, and have the proceedings of the meeting in my hands for publication.

An outline of the pamphlet on the "Powers and Duties of Local Boards of Health" has been prepared, and Mr. Hunter, of Warren, was consulted in regard to it. He has agreed to put it in shape for publication, with such additions as he may see fit to make.

Inquiries are being made by numerous health officers in regard to the time of the proposed meeting of the State Board of Health and Health Officers, and I would suggest that at our next meeting, or not later than the January meeting, arrangements be made for such a meeting.

Respectfully submitted.

C. O. PROBST, *Secretary*.

SEPTEMBER MEETING.

The Board met in regular session at its office in Columbus, September 24 and 25, 1890.

Present: Drs. Beckwith, Hoover, Sharp, Conklin, Wise and Prof. Nelson, with Dr. Beckwith in the chair.

The Secretary presented his quarterly report.

Dr. Beckwith, the retiring President, returned thanks to the Board and Secretary for their hearty support during the year, and requested Dr. Conklin to conduct the new President, Dr. Hoover, to the chair. This being done, Dr. Beckwith read an address on "The Art of Preserving Life."

Dr. Hoover made some fitting remarks, bespeaking the aid of the Board in the discharge of his official duties.

The Secretary, as Chairman of the Committee on Registration of Vital Statistics, reported that the Secretary of State, Mr. Ryan, had expressed himself as fully in accord with any movement for the improvement of the collection of vital statistics in Ohio, and ready to aid in securing a proper amendment of the laws for that purpose.

On motion, Dr. Hoover was associated with the Secretary as a special committee to present a report on a plan for securing an accurate registration of vital statistics in Ohio.

Dr. Hoover, Chairman of the Executive Committee, presented a report of the financial condition of the Board. The report was adopted.

The subject of "cheese poisoning," and the investigations of the Board to determine the cause of it, were discussed at some length.

The Secretary read a report of the special committee on Public Institutions (Dr. Hoover, Prof. Nelson and the Secretary), which embraced reports of investigations of the following institutions: Boys' Industrial School, Lancaster; Girls' Industrial Home, Delaware; Ohio Soldiers' and Sailors' Orphans' Home, Xenia; Institution for Feeble Minded, Columbus, and Institution for Deaf and Dumb, Columbus.

Discussion followed as to the best means of securing the adoption of the various recommendations embodied in the reports. The following resolution by Dr. Beckwith was adopted:

Resolved, That the President and Secretary be appointed a committee to present to the Legislature, or to the Trustees of the respective institutions investigated by the committee of this Board, a report of such investigations, and to take such steps as they may deem best to secure the changes recommended.

Dr. Hoover referred to a former investigation by the committee of the Children's Home at Wilmington, and stated that nothing had been done to remedy the evils found there. He offered the following resolution, which was adopted:

Resolved, That the buildings now occupied as the Clinton County Children's Home are unfit and inadequate for such use, and are hereby condemned by this Board.

Resolved, That the Commissioners of Clinton county be informed of the action of the Board.

The Secretary presented an outline of, with abstracts from the Fifth Annual Report. The report was adopted and ordered filed with the Governor for publication.

The President announced that the standing committees would remain unchanged, excepting the Executive Committee, which would be composed as follows: E. T. Nelson, Chairman, S. P. Wise and S. A. Conklin.

The Secretary presented a number of communications and made statements as to the action taken in each. Prof. Nelson stated that several members of the Ohio National Guard, living at Delaware, had been taken sick with typhoid fever that had evidently been contracted in camp at Presque Isle. The Secretary was appointed a committee to confer with the Adjutant-General in regard to selecting suitable sites for camps.

There being no further business the Board adjourned.

C. O. PROBST, *Secretary*.

SECRETARY'S QUARTERLY REPORT.

Mr. President and Members of the Board:

I have the honor to present the following report of the work of your Secretary since the last meeting of the Board:

According to instructions I left Tiffin the day after the Board adjourned and went to Fostoria to consult with the Board of Health in regard to the water-works in course of construction, and other sanitary matters. I spent the forenoon with the Superintendent of Construction of Water-Works, and in the afternoon, accompanied by the President, Secretary, Health Officer, and several members of the Board, made an inspection of the proposed water-works. The intended source of supply is a small creek, having its origin about ten miles from Fostoria. Its watershed is cultivated farm land, on which are several farm houses with the usual number of out-buildings; also pasture land, and a small area of forest. The creek is usually dry for four or five months each year. Two reservoirs are to be made, one for settling purposes and the other, which is much larger, for storage. The settling basin or reservoir, is arranged to be filled from the creek through a canal which takes its supply from the creek about one mile above the settling basin. The bottom of the canal is several feet higher than the bottom of the creek, so that water will only enter it when the creek is high. Consequently the settling basin will only be filled with the freshest water, and the first washings of the soil will be carried off and not allowed to enter the canal. The settling basin can be emptied at any time, and it is contemplated to have it perfectly

dry and exposed to the sun for three or four months each year during dry weather. An underground conduit leads from the settling basin to the storage reservoir, which is about a mile distant. This storage reservoir is twenty-one feet deep, extends over an area of several acres, and has a capacity of 100 million gallons. Its sides are to be nearly perpendicular, and with the bottom will be puddled with clay. It is expected that ten feet of water will always be kept in the reservoir, which, with the perpendicular sides, will, it is claimed, prevent vegetable growth in the water. It is estimated that fifty million gallons, or half the reservoir's capacity, will supply Fostoria with water for six months.

A circular filter of sand and gravel, 100 feet in diameter, is to be built at a level considerably below the reservoir, and water from the reservoir will be discharged so as to rise fifteen to seventeen feet in the air in the form of a spray, in order to aerate the water, and it will then pass through the filter. Water is to pass through the filter at the rate of six feet in twenty-four hours. After filtering, the water will be pumped into a stand-pipe and be delivered to consumers by gravity. The stand-pipe will be of sufficient capacity to supply the city several days, so that the filter can be frequently cleaned. Tests for the purity of the creek water had not been made; it had been tested for hardness, however, and was pronounced a soft water. The estimated cost of the water-works is \$200,000. Inquiring as to other possible sources of water supply, I learned that the soil formation around Fostoria is loam and sand of varying depth, overlaying a limestone formation 300 to 400 feet thick, and beneath this, shale is found for a considerable depth. Several deep wells have been bored and considerable water found, but all of such excessive hardness that it could not be used in steam boilers. No artesian water has been found, and shallow wells are said generally to be impure. The city was most anxious to secure a soft water that could be used by railroads and manufactories.

The city is not provided with sewers except a few short storm-water sewers. The matter had been considered by council, and the city engineer drew up a plan for sewerage the city. There were two out-falls in this plan, both into the same creek that is to furnish the water supply, but at a considerable distance below the in-take. It should be noted that this creek is usually dry all summer.

After looking over the proposed water-works, a tour of inspection of the city was made. The town is quite flat in many parts, and surface drainage is very imperfect. The gutters, with few exceptions, were filled with foul and stagnant water, and over-grown with rank vegetation. In one place a railroad embankment in the corporation has cut off the drainage of a considerable part of the town. A large block belonging to a man in Cleveland was shown me, the cellar of which was flooded with very

filthy water. It had been in this condition for a long time, in spite of the protest of the Board. The second story of this building is used for dwelling purposes.

A special meeting of the board was held at night, and I was asked to address them upon what had been shown to me. I expressed the opinion that the proposed water supply was of inferior quality and might become dangerous. That the proposed plans for purifying the water were most admirable, and would make the best of a bad source. I advised that the water-works company, or the Board of Health, should secure police surveillance of the entire water shed of the creek above the settling basin, and that such sources of pollution as privies, hog-pens, stables, etc., be carefully looked after. The proper course to pursue with the railroad company, the owner of the block with the bad cellar, and the street commissioner, to have the nuisances spoken of abated, was pointed out. These and other matters connected with the Board's work were freely discussed. A vote of thanks was tendered the Board and its Secretary for the assistance rendered.

POISONING FROM EATING PRESSED CHICKEN.

On June 25, 1890, a public sale took place at the farm of Mr. Curtis, who lives near Galena. Nineteen persons ate dinner there that day, and fifteen of these were taken more or less violently ill within from two to four hours after eating. The symptoms in the majority of cases were first vomiting of food, then a watery fluid, in most cases of a reddish brown appearance. Bilious vomiting was also present in some cases. In one case blood was vomited, and in this case there was also a discharge of bright, red blood from the bowels. Diarrhœa, with frequent evacuations, was present in nearly all cases, while great prostration with cold sweats, feeble heart action, etc., was commonly present. Tenderness in the region of the stomach was a frequent symptom, but was mainly due, I think, to excessive vomiting. Cramps of the muscles of the extremities was complained of by a few. All recovered in from twelve to twenty-four hours.

Two persons who were sick ate dinner at home and ate only chicken and cake, and drank iced tea, at Mr. Curtis'. This narrowed the investigation down to these three articles. Of the four who were not sick, one, Cora Dixon, servant of Mr. Curtis, ate cake, drank tea, but had no chicken. Walker Dixon, her father, drank of the tea but ate no chicken or cake. John Landon ate of the cake but had no chicken or tea. Howard Curtis drank tea, ate cake, and thinks he ate of the chicken, but could not be certain. His sister-in-law, who waited on table, thinks he did not eat any of the chicken. A small boy, not counted in the nineteen, who ate dinner, had a piece of the cake and was not sick.

It will be seen that of the cake, chicken and tea, one of which undoubtedly caused the sickness, chicken was the only article abstained from by those *not* sick. I was able to learn what thirteen of the fifteen who were sick ate for dinner; each of them had chicken, and it seems clear that all of the cases of poisoning were due to the development of poisonous ptomaines in the chicken. It should be stated that Howard Curtis claims to have fed some of the pressed chicken to some chickens, and with no effect.

About two ounces of the iced tea, two small pieces of the cake, and a quarter of a pound of the pressed chicken were secured and taken to Prof. Weber for examination.

The chicken had undergone decomposition and could not be examined. Prof. Weber considered it unnecessary to examine the tea or cake, and agreed that it was the development of poisonous ptomaines in the pressed chicken that had caused the sickness.

The chickens that were eaten were killed Tuesday morning, and were prepared by boiling them until the flesh dropped from the bones and then pressing them. They were kept twenty-four hours before being eaten.

INVESTIGATION OF A NUISANCE CREATED BY A STRAW-BOARD WORKS AT PLAIN CITY.

On July 31, 1890, at the request of Mr. H. B. Convers, township trustee, I visited Plain City and made an examination of Big Darby creek, of which complaint was made.

In company with Mr. Converse and some ten or twelve gentlemen owning property adjoining the creek, I examined the stream and found the following conditions:

We first drove to the Amity bridge, which crosses the creek about three miles below the straw-board works, and noted the condition of the stream at that point. The Big Darby here is, or was then, a shallow, sluggish stream, and for some distance above and below the bridge the water was almost as black as ink. Several hundred fish, large and small, were floating dead in the water or lodged at the margins of the stream. Bass, cat-fish, perch and other varieties were found. A slight but disagreeable odor was noticable on the banks of the creek, and this was quite pronounced at the water's edge. Proceeding up the stream it was found that it became much clearer, although by stirring up the bottom with a pole, a dark deposit would rise and follow in the wake of the pole. A few dead fish were found a mile, perhaps, above the bridge, but the great majority were found near it. The creek flows quite near to the cluster of houses that form the village of Amity, and the testimony of a number of persons

living in that vicinity was taken. All agreed in pronouncing the creek a source of great discomfort on account of the bad odor arising from it. This was said to be much worse at night and morning. Many persons testified that at times it was impossible to keep windows open facing the creek; and some claimed to have suffered from nausea and loss of appetite on account of the bad odor. Dr. Jewett, of Amity, said that he had been made quite sick by the odor, when he was driving over the Amity bridge.

I next visited the straw-board works and consulted Mr. Wood, Manager, and at this time part owner of the works. The plant is of moderate size, owned by Wood & Son, but negotiations were then pending by which it was expected to transfer the works to a straw-board syndicate. (I may say here that I have since learned that this has been done and that Mr. Barbour, of Akron, is the President of the syndicate.) Mr. Wood said that they had formerly emptied their waste into a shallow basin of considerable extent, but had abandoned this on account of complaints made. The waste is now discharged into a well connecting with a sewer which empties into Big Darby creek a short distance below the works. Mr. Wood said that if he retained the ownership he was willing to make any changes that could be devised to prevent a nuisance. I suggested that this might be accomplished by a series of settling pits, six or eight in number, the last one or two of which should be provided with coke and gravel for coarse filtering. The waste to pass successively from No. one to six.

I secured two one-gallon jugs and filled one with water from the creek just below Amity bridge. I then drove three-quarters of a mile above the works and filled the other. The creek at this point was comparatively clear, and no dead fish could be found. I instructed Mr. Converse to have the township trustees employ men to remove all dead fish along the creek and shores and burn them. This he promised to do. He also agreed to secure affidavits from at least twelve responsible men living along the creek in regard to its condition, and the odor and annoyance caused thereby. The samples of water were submitted to Prof. Weber for analysis:

No. 1, water taken at Amity Bridge. No. 2, water taken above the straw-board works.

Sample of water received of Dr. Probst, August 13, 1890, marked No. 1 on cork:
Parts of organic matter in solution in 1,000,000 parts of water 219.6
Color of water, yellowish. Slimy deposit.

H. A. WEBER, *Chemist*.

Sample of water received of Dr. Probst, August 13, 1890, marked No. 2 on cork:
Parts of organic matter in 1,000,000 parts of water..... 57.5
Water colorless. No deposit.

H. A. WEBER, *Chemist*.

In this connection I wish to call your attention to the amendments to section 6925 and section 7231, and to supplemental sections 6920a, 6920b and 6920c of the Revised Statutes, as enacted by the last General Assembly. They read as follows:

SECTION 1. *Be it enacted by the General Assembly of the State of Ohio*, That section 7231 and section 6925 (as amended April 16, 1888, O. L., vol. 85, p. 286), be amended, and that supplemental sections with sectional numberings as 6920a, 6920b, and 6920c, be added to section 6920, so as to read as follows:

Sec. 6920a. The county commissioners of any county, whenever there is a violation of any of the provisions of either of said sections named in section 6919, are authorized to employ and reasonably compensate, at such times as they may deem proper, one inspector of nuisances who shall be vested with police powers, and shall be authorized to examine all cases of violation of the provisions of said sections, and for such purpose and for the purpose of obtaining evidence, he shall be fully authorized and empowered to enter upon the premises of any person in any county, and it shall be the duty of such inspector to make or cause to be made a complaint and to institute prosecution against any person or corporation violating the provisions of either of said sections, and such inspector shall not be required in the prosecution of any such proceeding to give security for costs.

Sec. 6920b. The prosecuting attorney shall be the legal adviser of such inspector and the attorney in all such prosecutions, and in lieu of any percentage on fines and costs, he shall be allowed a compensation for such services by the county commissioners, to be paid out of the county treasury.

Sec. 6920c. A judgment for fine and costs rendered against any person or corporation for the violation of the provisions of either of said sections mentioned in said section 6919, when the defendant has no property, or when the defendant has not a sufficient amount of property within the county upon which to levy to satisfy such judgment and costs, may be enforced and collected in the same manner as judgments are collected in civil cases, upon execution duly issued from any such court to any sheriff of any county of the state.

Sec. 6925. Whoever intentionally throws or deposits, or permits to be thrown or deposited, any coal dirt, coal slack, coal screenings, or coal refuse from coal mines, or any refuse or filth from any coal oil refinery or gas works, or any whey or filthy drainage from a cheese factory, upon or into any of the rivers, lakes, ponds, or streams of this state, or upon or into any place from which the same will wash into any such river, lake, pond or stream; or whoever shall, by himself, agent or employe, cause, suffer or permit any petroleum or crude oil, or refined oil or refuse matter or filth from any oil well, or oil tank, or oil vat, or place of deposit of crude or refined oil, to run into, or be poured, or emptied, or thrown into any river, or ditch, or drain, or water-course, or into any place from which said petroleum, or crude oil, or refuse matter, or filth, or refined oil may run or wash, or does run or wash into any such river, or ditch, or drain, or water-course, shall be fined in any sum not more than one thousand dollars nor less than fifty dollars; and such fine and costs of prosecution shall be and remain a lien on said oil well, oil tank, oil refinery, oil vat and place of deposit, and the contents of said oil well, oil tank, oil refinery, oil vat or place of deposit, until said fine and costs are paid; and said oil well, oil tank, oil refinery, oil vat or place of deposit, and the contents thereof, may be sold for the payment of such fine and costs, upon execution duly issued for that purpose.

Sec. 7231. When an indictment is presented against a corporation, a summons commanding the sheriff to notify the accused thereof, and returnable on the seventh day after its date, shall issue on the precept of the prosecuting attorney; such summons, together with a copy of the indictment, shall be served and returned in the manner provided for service of summons upon such corporation in civil actions; and if the service can not

be made in the county where the prosecution began, then the sheriff may make service in any county of the state upon either its president, secretary, superintendent, clerk, cashier, treasurer, managing agent, or other chief officer, or by a copy left at any general or branch office, or usual place of doing business of such corporation, with the person having charge thereof; the corporation, on or before the return day of a summons duly served, may appear by one of its officers, or by counsel, and answer to the indictment by motion, demurrer or plea, and upon its failure to make such appearance and answer, the clerk shall enter a plea of "not guilty;" and upon such appearance being made, or plea entered, the corporation shall be deemed thenceforth continuously present in court until the case is finally disposed of.

SECTION 2. Said original section 7231 and said section 6925, as amended April 16, 1888, be and the same are hereby repealed.

SECTION 3. This act shall take effect and be in force from and after its passage.

This act provides for the abatement of a class of nuisances that have caused the Board a great amount of trouble. The Board is frequently requested to aid in securing the abatement of nuisances of this character—nuisances outside the jurisdiction of municipal authorities; I purpose, with your approval, to refer all complaints of this character to the commissioners of the proper counties. You will note that the appointment of this "Inspector of Nuisances" is optional with the commissioners, and I would suggest, if it is found that commissioners fail to enforce the law against nuisances, that an attempt be made to have its provisions mandatory whenever the State Board of Health, after a proper investigation, shall officially notify them of the existence of nuisances of this class. This would greatly strengthen the hands of the Board, and yet relieve it of the costs of prosecution.

I wrote to Mr. Convers, after my investigation at Plain City, and informed him that the matter would be placed in the hands of the commissioners of Madison county. A communication was sent to the commissioners informing them of the result of our investigation, citing them to the act of last winter, and requesting them to take action in the matter as soon as possible.

REPORTED CHOLERA AT CARROLLTON.

The Columbus Evening Dispatch on Saturday, September 13, reported that a malignant disease was prevailing near Carrollton, seven out of eight persons affected having died in one day. That a man named John Tool had died that day after a sickness of twelve hours, with vomiting, rice-water discharges from the bowels, cramps, etc., and that the attending physician, Dr. Williams, of Carrollton, had pronounced it Asiatic cholera. I immediately telegraphed to Dr. Williams for full particulars, and also to the mayor of Carrollton, asking for information. On the following Monday a telegram was received from Dr. Williams, giving a full description of the symptoms of John Tool, who had died, which were

essentially those of cholera. A history of the man, which I secured the following day, showed that it was impossible for him to have been exposed to Asiatic cholera as he had not been from home and there had been no new arrivals in the neighborhood by whom the disease could have been imported. Further reports showed that the disease was not Asiatic cholera, and the sensational newspaper reports which were being widely circulated, were promptly corrected.

Friday, the 19th, about 3 P.M., the Journal and Dispatch representatives called to inquire about cholera at Bergholz. A dispatch had been received by them from the Associated Press at Cincinnati, reporting cholera at Bergholz, and asking this Board to investigate. There being no telegraph office at Burgholz, and finding that the village is only about eight or ten miles from the cases previously reported, I decided to go there, and left on the first train. I reached Toronto at 6 A.M., next morning and called on my friend Dr. Collins. to learn if he had heard of the reported cholera. He had not, but kindly consented to accompany me to Burgholz to investigate the matter. After a long hard drive we reached Bergholz at 2 P.M. Near the village we met a party returning from a burial. On inquiry we learned that a man named Starn had just been buried, he having died after an illness of twenty-four hours. We were told by one of the party that Starn had died from the effects of a spree. At the village we called on the attending physician, Dr. Leeper, but unfortunately found him from home, not to return until night. From the Doctor's wife, and from the neighbors of Starn, we learned that he was a miner about forty years old. Thursday, September 18, he went to Minerva, a village near Burgholz, and came home intoxicated. He continued on a spree for several days, but on Tuesday and Wednesday before he died he was able to work, though he was still drinking. Wednesday about 8 o'clock he took a dose of castor oil and soon after was seized with severe purging, vomiting and muscular cramps. Dr. Leeper was called soon after, but in spite of treatment the man died Thursday night, about twenty-four hours after taking down. We were told that twice before he had had similar spells, and, although the case was somewhat peculiar, we concluded that it could not possibly have been Asiatic cholera.

As I was within fifteen miles of Carrollton, with Dr. Moody and Dr. France, physicians who had treated most of the cases reported, directly on the way, Dr. Collins kindly agreed to return to Toronto alone, and I secured a man to drive me to Carrollton. Dr. Moody told me that he had treated three cases, two of them dying, and had seen four cases in consultation with Dr. Watt, of Mechanicstown, two of these dying. The patients were sick from eight to fourteen days with more or less fever and diarrhœa, and often vomiting. The diarrhœa in some cases had been very

severe. He considered them all cases of typhoid fever, one dying, he thinks, from concealed hemorrhage and another from peritonitis. Dr. France, of Harlem Springs, informed me that he had had one case of this character, but had seen some of the others in consultation. He pronounced them typhoid fever, but differing from the usual run of cases. As soon as I reached Carrollton I telegraphed the papers that the disease was not cholera. At Carrollton I met Dr. Williams. He repeated the history previously given of John Tool, except he said that the man had had a temperature of 100° to 101° for some time before he died.

I met the mayor and talked with him in regard to a Board of Health. He said he had for some time been unable to find six men who would serve as members. He promised to take advantage of the present scare and make a strong effort to have a Board appointed at once.

INVESTIGATION AT FRAZEYSBURG, OHIO.

On July 2, in answer to the petition presented at our last meeting, I visited Frazeysburg and found there the following conditions:

The village, containing about 800 inhabitants, is on the Pan Handle R. R. fifty miles from Columbus. The location is bad, some parts of the town being so low that they are never drained. For some time previous to my visit excessive rains had occurred; water had settled to such an extent in the lowest part of the village that the boys were able to swim in one of the principal streets. At this place, which is near the center of the town, about an acre was under water, and thickly covered with a green vegetable growth. Other parts of the village were also under water, but to a much less depth. The cellars of all houses within 100 yards of the deeply flooded district were more or less full of water. Residents of this part of town were clamorous for relief, and had urgently demanded that council should construct sewers for drainage purposes. Parties living in higher districts, along either of two available outlets for a sewer, were as strongly fighting taxation for this purpose, claiming that those to be directly benefited should pay the cost. Between these opposing factors council remained inactive, and the State Board of Health was consequently petitioned to interfere. Public feeling was at a high pitch, and council was greatly incensed at the action of the petitioners in calling upon the Board. On my arrival, not knowing of this, I was unfortunately taken in charge by the petitioners, headed by Dr. Corn. After talking the matter over I proposed a joint meeting of citizens and the council, but council refused to meet me. Leaving the petitioners I succeeded in getting the ear of the Mayor, and through him got hold of four members of council. The flooded districts were visited and plans and

route for sewers discussed. One of the members, an intelligent man, pointed out several legal difficulties in the way of constructing a sewer. Special legislation had been secured last winter which it was expected would remove the difficulty, but the act had been pronounced defective by a Zanesville lawyer. I advised that the flooded district be declared a public nuisance detrimental to health, and that steps be taken at once to provide proper drainage. I also advised that a committee be appointed to visit Zanesville, the nearest city, and lay the whole matter before the best lawyer that could be secured. This was agreed to.

The petitioners were advised to wait a reasonable time, and if nothing was done to relieve them, to bring suit for a writ of mandamus to compel council to construct a sewer.

I was able to create a more amicable feeling between opposing factors, and left with the assurance that something would be done at once.

The following letter was recently received from Dr. Corn :

FRAZEYSBURG, OHIO, *September 20, 1890.*

Dr. C. O. Probst, Columbus, Ohio :

DEAR DOCTOR: In reply to yours of the 17th inst., I have to say that contractors are working on a sewer now, and will probably have it completed by November 1, 1890. The sewer will empty into the canal at a point east of the village, and I think it will afford efficient drainage to all north of the railroad. This much has been accomplished without the aid of the courts, for which I think we are indebted to you.

There has been so far no more than the usual amount of sickness. At present we have nothing more serious than intermittent fever. No scarlet fever nor diphtheria the present year.

Respectfully yours,

JASPER CORN.

Since the last meeting of the Board I was again called to Wilmington to advise with the local Board in regard to the abatement of a nuisance they had been unable to deal with, and other matters connected with their work. I was also called to Sabina where the Board of Health was re-organized, the rules and regulations recommended by the State Board being adopted and a comprehensive plan of sanitary work outlined.

The Board of Health of West Milton sent me a communication they had received from the council of that village, notifying them that the Board of Health had been abolished. I notified the council that their action in regard to the Board was illegal, citing them to the laws of Ohio regulating the establishment of Boards of Health, and requested them to rescind their action. This was done at the next meeting of council, and the Board of Health was reinstated.

The city solicitor of Columbus, in an opinion as to the funds available for the health department of that city, recommended that the number of sanitary policemen should be reduced, stating as a reason therefor, that only five sanitary policemen were employed for the whole of the city of New York. This was published in several papers, and as it seemed calculated to injure the sanitary service of this, and perhaps other cities. I wrote to Dr. Edson, Health Officer of New York, for a statement of the number of men and the amount of funds used annually by their health department. His reply, which I published, showed that they employ nearly 200 men (40 of them sanitary policemen), and spend about \$300,000 per annum.

September 8 a telegram was received from the health officer of Lima reporting malignant diphtheria in a family living near Harrod, with three deaths having already occurred. The following day the station agent of Harrod reported the cases, and stated that no precautions were being taken to prevent spread of the disease. I telegraphed instructions to the township trustees to quarantine all afflicted families and to prohibit public funerals. I also sent a package of diphtheria circulars for distribution. The instructions were followed and the disease promptly arrested.

A number of outbreaks of typhoid fever, scarlet fever and diphtheria have been reported; in all such cases proper instructions have been given in regard to measures to prevent spread, and packages of pamphlets relating to the restriction of these diseases sent for distribution.

Investigations have been made of the following public institutions: The Boys' Industrial School at Lancaster; the Girls' Industrial Home at Delaware; the Ohio Soldiers' and Sailors' Orphans' Home at Xenia; the Imbecile and Deaf and Dumb Asylums at Columbus. Reports of these investigations have been placed in the hands of Dr. Hoover, chairman of the special committee on public buildings.

Arrangements will be made to hold a meeting of representatives of local Boards of Health at the time of the January meeting of the State Board.

The usual routine work of the office has been carried on as heretofore. All of which is respectfully submitted.

C. O. PROBST, *Secretary.*

CHEESE POISONING IN OHIO.

During the year 1888 quite a number of cases of "cheese poisoning" occurred in Ohio, which were investigated by the State Board of Health. The facts in connection with nearly 300 cases were examined into with the hope of finding the conditions underlying the development of cheese

poison, or "tyrotoxicon" of Vaughan, which we assumed to be the cause of the sickness.

With this end in view, a careful inspection was made of the cheese dairy of Messrs. Saxbee and Needham, located near Mechanicsburg, where cheese had been manufactured which had produced sickness in over one hundred persons who ate of it.

A full history of most of these cases was secured at the time from the attending physicians, and there seems no reason to doubt that the cheese was the cause of the sickness.

The investigation included the method of manufacture, the condition of the cheese-house and its surroundings, the condition of the cows furnishing the milk, including their food, pasture, water supply, etc. Nothing to which the bad cheese could be attributed was found, nor was there any thing in the process of manufacture or keeping of the milk that afforded any clue to the cause of the trouble. A number of cheese dairies in the neighborhood were visited, and the conditions in all were essentially the same, while the process of manufacture was identical, all of those engaged in cheese making having been instructed in the trade by one person.

The cheese made by Saxbee and Needham continued bad for several weeks. That is, while the business of cheese making was suspended for a time, continued experiments in cheese making were tried. A thorough renovation, and finally the complete removal of the cheese house was made; the process of manufacture was varied as far as possible, but still the cheese made produced sickness in many who ventured to eat of it. A few weeks later a part of the dairy cows were sold, and one cow was found with a sore teat that yielded pus and blood with the milk. This teat, it was afterwards learned, the calf had refused to take. From the time part of the cows were sold and this cow's milk was excluded, no further trouble was experienced.

Some hundred or more persons were made sick from eating cheese made by Mr. Clark, who has a cheese dairy near Medina. An inspection of the dairy revealed nothing to account for the trouble. The most scrupulous cleanliness was observed in every particular; the cows that furnished the milk were healthy and well fed, and had pure water to drink.

Mr. Clark at that time was making full cream cheese, and was inclined to think that the trouble had some connection with this fact. His theory was that the cream, not being coagulated by the rennet, is simply mechanically incorporated in the cheese and is extremely liable to undergo decomposition. He had had considerable trouble with his cheese, finding bad lots during three seasons' make. Between April 15 and May 18, all of the cheese made was bad.

To test his theory in regard to the cream being the cause of the trouble, he commenced May 18, to withhold the cream skimmed from the night's milking. From that time to the present date he has had no further trouble with his cheese.

Twenty-three persons in Cambridge were made sick by eating of one cheese made by Mr. Wright, of Wellington, Ohio. The factory where this cheese was made was not inspected, but Mr. Wright states that of a number of cheese made at the same time, and of the same curd, this was the only one that caused trouble; and furthermore, that in ten years' experience this was the first time he had ever known one of his cheeses to cause sickness.

A family of five persons living in Akron, were taken violently ill after eating freely of cheese for supper. The cheese was made at a factory at Bemus Point, N. Y. This cheese was one of six made from the same curd, and yet it was the only one known to have produced sickness.

The facts given above are stated at greater length in the Third Annual Report of the Board.

During the present year—October, 1889 to October, 1890—the subject of cheese poisoning has again come before the Board on account of a number of cases occurring in Ohio.

As some doubt had been expressed in regard to the conclusions reached in our examinations in 1888, viz.: That cheese poisoning is not always due to the presence of tyrotoxin in the cheese, we submitted samples of the suspected cheese to three competent chemists, requesting that a careful examination be made for tyrotoxin.

The first cases reported were by Dr. Hinkle, health officer of DeGraff, who sent the following account of them :

DEGRAFF, OHIO, June 13, 1889.

C. O. Probst, M. D., Columbus, Ohio :

DEAR DOCTOR: Your letter of recent date duly received. The number of cases that required treatment were six. I believe symptoms occurred from three to four hours after eating of cheese; first nausea, followed soon by violent vomiting, which first consisted of contents of stomach, followed by severe purging, cramping of stomach and bowels. Later on vomit consisted of a watery fluid, somewhat greenish at times, patients complaining of a bitter taste. From bowels a greenish watery discharge with mucus, etc. Cheese appeared in lumps from mouth and bowels; vomiting very frequent for from six to ten hours; great depression of vital powers; cold extremities. In fact, the symptoms were peculiar to cholera morbus. Sickness continued from two to four days. A number of persons complained who had eaten of cheese, symptoms all mild, but similar. The sickest were those who had eaten heartily on an empty stomach. I have twice eaten three ounces of the same cheese with no ill effects. Mr. McCracken, the maker of the cheese, has been using of the same cheese in his family, also giving to neighbors, none of whom complained of ill effects. The cheese was made after the usual manner and with the greatest care and cleanliness, and was three weeks old when sold or used. The cows all seem very healthy; milk from each cow has been carefully examined and used separately by the family, and all seems of the best quality and taste. Cheese was full

cream. The name of the manufacturer is S. M. McCracken, Quincy, Logan county, Ohio. If the analysis results negatively, please certify to that effect and be kind enough to get a statement of chemist that Mr. McCracken can publish same.

Respectfully,

W. H. HINKLE, M. D.

An inspection of the cheese dairy of Mr. McCracken was made about a week later.

Mr. McCracken is a farmer who commenced to make cheese in a small way, April 18, 1890. A practical cheese maker was secured who made his cheese for a time, and made the cheese that caused the sickness reported. Two or three of the first cheeses made caused sickness, and one of these furnished the sample we examined. This cheese had been cured about three weeks when eaten, and was made as follows: The night's milk from sixteen cows was strained into a cheese vat and stirred and cooled by water surrounding the vat until the animal heat had been extracted. In the morning the cream was skimmed from this milk and the morning's milk added, and also the cream from the night's milk, which was passed through a strainer. The temperature was then raised to 80 to 84 degrees Fah., a thermometer being used. Rennet extract was then added and the resulting curd raised to about 110 degrees. The curd, after salting, was cut into small cubes with a curd knife, and at the proper time, the whey withdrawn and the cheese put to press. The curing room is a part of the farm house, as is also the cheese room, and its temperature varies with outside temperatures. The vat, utensils, etc., were perfectly clean, and were always cleaned with scalding water after using.

The cows were examined, and all presented a healthy appearance. All were said to have been well at the time the bad cheese was made. They had access at that time to about sixty acres of pasture, and were drinking water found standing in the fields from excessive rains.

Part of the cheese that caused the sickness was returned to Mr. McCracken, and he and his family ate freely of it with no bad effect.

Part of the same cheese was submitted to Prof. Weber, of the Ohio State University, for examination. His report will be found on a subsequent page.

On the same date, June 13, the Health Officer of Shelby, Dr. Love, in answer to an inquiry from this office reported as follows:

SHELBY, O., June 13, 1890.

C. O. Probst:

DEAR SIR: In reply to your inquiry will say the symptoms of all the cases of cheese poison were in the main uniform. First, a sense of weight in the stomach, pain, nausea, vomiting, followed by free and active catharsis of watery character and later of mucus. The matter vomited was first, the contents of the stomach and the cheese

partially digested, then mucus mixed with bile, and in the more severe cases traces of blood. A number of the severe cases suffered a constriction in the pharynx and a dryness and a sensation of burning in the mouth, oesophagus, throat and stomach, causing most extreme thirst. One lady described it as though she had taken some tobacco into her mouth and swallowed some of the juice. This symptom preceded the nausea and vomiting. The pulse in all cases was small, feeble and quick; skin cool and moist; countenance denoted extreme exhaustion; duration of attack from two to twelve hours. The grocer and one clerk ate the cheese and were unaffected while another clerk and the grocer's wife (the latter for the sake of experiment) ate also and both became very sick.

The cheese was bought of Albert F. Remy & Co., Mansfield, Ohio, June 4, 1890, and I think it was manufactured by S. C. McNeill, of Akron, Ohio, who runs four factories. He uses Wells, Richardson & Co's butter color in small quantities and never had any trouble before. Any further information will be cheerfully furnished.

Very truly,

M. T. LOVE, M. D.

P. S.—There are no more new cases, and they all arose from the one cheese which I sent you; about twenty or more cases as near as I can learn.

About three weeks later a second series of cases of cheese poisoning were reported at Shelby which, as will be seen by the following letter, were caused by a cheese from the same lot as the one that caused the cases reported by Dr. Love:

MANSFIELD, OHIO, July 8, 1890.

Dr. C. O. Probst, Columbus, Ohio:

DEAR SIR: We have yours, and in reply will say that the cheese in question was made by S. C. McNeill, Akron, Ohio. This has been a great annoyance to us, but of course we can not help it. We have sold hundreds and hundreds of this brand of cheese and have never had a complaint until about a month ago, when the report came from Shelby that a number of parties were poisoned by eating of it. Two or three days ago, one of our customers, Mr. W. J. Wilkinson, of Shelby, reported that he had also received some of the poisoned cheese, and upon investigation we find that notwithstanding this was not discovered till a few days ago, Mr. Wilkinson's cheese was out of the same lot as the one Mr. Askew purchased of us. Evidently we have never had but one lot of cheese that caused sickness, although we have been receiving two or three lots a week from Mr. McNeill. There were probably twenty cheeses in the questionable lot, but so far as we have been able to find out, there were only six or seven that caused sickness. Mr. W. did not discover the trouble until so late a date because at the time we sent Mr. Askew the one, we sent five to Mr. Wilkinson, none of which caused sickness till he came to the last one. Mr. Wilkinson returned this one to us, and yesterday we sent a piece of it to Dr. Reed, who will very likely send it to you for examination. We would like to have you investigate this matter thoroughly, and advise us what we can do to avoid a repetition of such circumstances. Any information you can give us will be thankfully received, and in turn, any information we can give you will be cheerfully given. We have just this morning received a letter from Mr. McNeill in regard to the cheese returned to him, which will probably be of interest to you. We inclose you same and wish that you would return same when you are through with it.

Yours truly,

ALBERT F. REMY & Co.

The following report of the second series of cases of cheese poisoning at Shelby was kindly furnished by Dr. Hyde of that place:

Dr. M. T. Love, Shelby, Ohio :

DEAR DOCTOR: I have the honor to acknowledge the receipt from you of a communication from Dr. C. O. Probst, Secretary Ohio State Board of Health, containing a request for certain information respecting several persons supposed to have been poisoned by cheese.

A local grocer sold cheese known as the "Champion" brand to several families residing in East Shelby. As near as I can learn fifteen persons ate of it; of these fourteen became sick, and one escaped. The one who escaped, however, had eaten but a very small quantity. The following contains all the information called for:

CAUSATION.

As all ate of the same cheese, at about the same time—supper—and all but one became sick at about the same time, in the same manner, and all exhibited throughout the attack substantially the same symptoms, it is fair to infer, nay, to declare, that the cause of the sickness lay in the cheese that had been eaten.

What was that cause? (1). It may have been a salt of copper, the milk from which cheese is made being often, I am informed, manipulated in copper vessels, for it is easy to comprehend how sour milk which contains lactic acid in contact with copper could easily result in the formation of lactate of copper. Whether or not sufficient of a copper salt would be formed in this way to poison persons eating less than two ounces of the cheese made from milk which had been contained in copper vessels, I will not endeavor to say, but I think not; certainly not without imparting a metallic taste to the cheese, and this did not obtain, or at least was not mentioned by any of the persons attacked. It must be confessed, however, that many of the symptoms, as will be seen under the head of symptomatology, were remarkably similar to those produced by copper salts.

(2). It may have been a tin or zinc salt, the milk in dairies often being kept in vessels made of these materials, but as what was said about copper is equally applicable to tin and zinc, it is unnecessary to follow our discussion further under this head.

(3.) It may have been "tyrotoxinon." But what is tyrotoxinon? I do not know, neither can I find much in current medical literature to enlighten me on the subject. Prof. Vaughan, of the University of Michigan, claimed in 1886, that he had discovered in cheese a poisonous principle which he called tyrotoxinon. According to Prof. Vaughan, it is a ptomaine, or an analogous substance, being also found in decomposing milk and cream. As the symptoms exhibited by my clients were so similar to the symptoms produced by the substance which Prof. Vaughan discovered and experimented with, I am constrained to conclude, that the people of East Shelby, who were sick, were poisoned by "tyrotoxinon," whatever that may be.

The following facts support the conclusion: The cheese that did the mischief was the last of a lot of five. Four had already been sold and had caused no trouble; but the fifth and last one prostrated fourteen persons before one-fourth of it had been sold. Had not the grocer promptly discontinued the sale of it immediately upon learning of its containing a supposed poison, there is no telling how many more would have been poisoned. Now, it is reasonable to suppose, that the milk from which these five cheeses were made had been manipulated in the same vessels, and should therefore, if the poison was metallic, all have contained it. To my mind it is easier to believe that the milk from which the fifth cheese was made had undergone decomposition in greater or less degree; or, that the fifth cheese itself, being on hand while its four companions were being sold, had undergone decomposition in sufficient degree to result in the formation of "tyrotoxinon," ptomaine, or whatever the poisonous principle was.

SYMPTOMATOLOGY.

All the persons attacked exhibited in greater or less degree identical symptoms, varying in accordance with the quantity of cheese eaten, or the susceptibility of the person to the influence of the poisonous principle. The one who did not suffer at all had eaten but "a taste," while the mildest attack occurred in a man who must have eaten at least four ounces. In this case there must have been a very tolerant organism. On an average, as near as can be learned, from one to two ounces of cheese were eaten per capita. For about two hours after the ingestion of the food no untoward symptoms occurred; then occurred malaise distress in the stomach soon followed by all the symptoms characteristic of the affection. Following is a description of an average case: Mrs. G. act 33, ate cheese at six o'clock, P. M. For about two hours she was free from complaint. During the following hour she experienced an indescribable sense of malaise "aching of the bones," lumbar pain and headache and symptoms of embarrassed digestion. During the fourth hour following the ingestion of the cheese, nausea, vomiting and diarrhoea occurred. The nausea was intense, the vomiting violent, and the alvine dejections copious, watery and frothy. The vomited matter contained much fluid, considerable mucus and biliary coloring matter and an admixture of partially digested food. There were violent spasmodic pains in the entire abdomen, and spasms of some of the voluntary muscles; especially of the muscles of the abdomen, and those of the calf. There was also vertigo, numbness of the extremities, dryness of the mouth and pharynx, and intense thirst. The morphia and atropia which were administered hypodermically may have contributed to the symptoms detailed in the preceding clause, but they were quite prominent before these drugs were administered. The temperature remained normal throughout and the pulse was but slightly accelerated. After the subsidence of the more active and acute symptoms there remained for two or three days burning and tingling sensations in the extremities, great susceptibility to the influence of heat, gastric irritability, somnolence and anorexia.

DURATION AND TERMINATION.

All the persons attacked resumed their vocation within twenty-four hours after the beginning of the attack and recovery was complete. Several of them did not summon medical assistance, though all but one belong to my clientele, and from these I have since learned that the acute symptoms are of much longer duration in persons who do not have professional treatment. Of the entire number that were under my treatment not one failed to experience marked relief within a short time from the beginning of treatment.

TREATMENT.

The administration of morphia and atropia hypodermically, ice internally, and dilute whisky, as soon as stomach would retain it, were the therapeutic measures employed with success in every case.

Respectfully,

A. F. HYDE, M. D.

The factory where these two cheeses were made is located on the Valley Railway, about ten miles north of Akron, and is a two-story building situated on the banks of the canal. Fifty feet south of the factory is a whey vat formed by an excavation lined with plank walls. Adjacent to the whey vat is a hog-pen, which contained three or four hogs when inspected. Drains are laid under the factory for conveying the whey that

runs through the floor to the whey vat. This whey vat was exceedingly foul, and a very bad odor from it was plainly noticable in the factory.

On the first floor of the factory are two large vats into which the milk is conducted through a tin spout leading from a platform out of doors on to which the milk is delivered by those furnishing it.

The process of manufacture is briefly as follows: The milk delivered in the evening is poured into the vats and well water run around it, the milk being constantly stirred until the animal heat is extracted. The milk stands in the vats all night, and about five o'clock next morning is skimmed. Between 7 and 8 A. M. the morning's milk is delivered and is mixed with the skimmed milk in the vats. The mixed milk is stirred and cooled as before, and the water around the milk is heated and the temperature of the milk raised to about 82 degrees Fabr., a thermometer being used. The rennet is then added (fresh calves' rennet having been used when the suspected cheese was made) and, after curding, cutting and salting, the mass is raised to a temperature of from 94° to 96°—never above if avoidable. A small amount of vegetable coloring matter is used. After cooking the cheese is put to press, each cheese averaging from 30 to 38 pounds in weight. During warm weather they are cured by natural heat in the upper story of the factory, from twenty to twenty-five days being allowed for this process. In making the cheese a number of flies, unavoidably it was said, got into the milk, but as far as possible these were removed.

The milk from which the cheese is made is received from seventeen farmers, living from one to four miles from the factory. The milking is done at from 4 to 6 A. M. and from 4 to 6 P. M., the milk being placed directly into the cans, without cooling, and hauled in wagons to the factory. The cans are made of heavy tin, the lids having an opening about an inch in diameter. It is customary for the farmers, on delivering the milk in the morning, to fill their milk cans with whey from the whey vat and take it home to feed to their pigs. This whey, as was mentioned before, was decomposed and exceedingly foul smelling, and it would be very difficult to properly clean the milk cans contaminated with it.

From eleven to twelve cheeses are made daily. The exact date of manufacture of the cheese that caused sickness could not be determined, but it was some time early in May

Every possible aid in the investigations made was given by the cheese manufacturers, and they were all very anxious to learn the cause of the trouble.

The sample of cheese received from Dr. Love, of Shelby, which produced the first series of cases of cheese poisoning at that place, was divided into three equal parts and one given to Prof. Howard, of the Starling

Medical College, one to Prof. Weber, of the Ohio State University, and one was sent to Dr. Baker, of the Michigan Board of Health, with the request that it should be examined by Prof. Vaughan, of Ann Arbor. A sample was also given to Prof. Detmers, of the Ohio State University, for biological examination.

Prof. Howard submitted the following report:

COLUMBUS, OHIO, *June 19, 1890.*

Dr. C. O. Probst, Secretary State Board of Health:

DEAR SIR: The cheese received from you, marked "Dr. M. T. Love, Shelby, Ohio," has been examined by me for the detection of tyrotoxinon, with the following results:

The piece weighing 2,125 grammes was cut into small cubes, three or four millimetres in size, placed in a percolator, and exhausted with distilled water, about 1,500 cubic centimetres being used, and this passed again and again through the percolator until soluble substances could be regarded as removed. The percolate was rendered alkaline with sodic carbonate and shaken with 500 C. C. stronger ether. After standing some hours, the ether was decanted and the percolate again shaken with ether, this removed, added to the original ether and the whole allowed to evaporate spontaneously.

After the evaporation of the ether, about 3 C. C. of aqueous extract remained, and from a fear that if the water present was entirely removed by evaporation, any tyrotoxinon present *might* be decomposed and thus lost, the evaporation was not carried to complete dryness, but the tests applied directly to the concentrated aqueous extract.

1. To a portion of this, potassic ferricyanide and ferric chloride were added. Prussian blue was promptly produced. As this reaction is common to many alkaloidal bodies, it can not be regarded as a distinctive test for tyrotoxinon, and while it may have been caused by tyrotoxinon, this can not be claimed as certain.

2. To a second portion a mixture of phenol and sulphuric acid was added. A brown coloration was obtained somewhat similar to that produced by tyrotoxinon, but as this test like the preceding is not characteristic of tyrotoxinon, the presence of this substance can not be proven.

3. A third portion was treated with nitric acid and potassium hydroxide for the production of the tyrotoxinon-potassium crystals, a characteristic test for tyrotoxinon. No crystals could be obtained by this test, except of potassium nitrate.

4. The remaining portion, about one-half of the entire solution, was administered to a kitten, about ten days old. The kitten was under inspection for fifteen hours, during which time there was no vomiting nor other symptoms of illness. When it is considered that the kitten received the substance which was in about 2½ pounds of cheese that was separated by the method described which would remove the tyrotoxinon, the absence of any substance that causes vomiting may be regarded as demonstrated.

As a result of the foregoing tests, I am obliged to say, that I do not believe that this sample of cheese contained tyrotoxinon.

Respectfully submitted,

CURTIS C. HOWARD.

Prof. Weber has submitted the following report, which includes his report of the cheese from DeGraff:

Examination of cheese for State Board of Health.

1. Sample of cheese from Shelby, Ohio.
2. Sample of cheese from DeGraff, Ohio.

Both samples were examined for tyrotoxinon according to the directions given by Vaughan. The ether extract gave two reactions, which are claimed for tyrotoxinon, viz.: the Prussian blue reaction, and the reaction with carbolic acid. On the other hand the test with potassium hydroxide, and the physiological test with a kitten failed completely in both cases.

As the first two reactions may be due to other causes and the two characteristic tests failed, it would seem, that the ill effects produced by the use of the cheese, were not caused by tyrotoxinon.

Yours very respectfully,

H. A. WEBER.

Columbus, Ohio, June 23, 1890.

Prof. Vaughan left home soon after receiving the sample of cheese I sent to Dr. Baker, and did not examine it.

A sample of the cheese that caused the second series of cases at Shelby—the ones reported by Dr. Hyde—was sent to Mr. E. A. Schweinitz, Chemist of the Bureau of Animal Industry, Washington, D. C., who reported as follows: (It should be borne in mind that the two cheeses from Shelby were of the same lot, made by Mr. McNeil.)

U. S. DEPARTMENT OF AGRICULTURE, BUREAU OF ANIMAL INDUSTRY,
WASHINGTON, D. C., *August 13, 1890.*

Dr. C. O. Probst, Columbus, Ohio:

DEAR SIR: Your letter inclosing a description of the method of manufacture of the cheese, and the account given by the physician in charge of the cases of sickness, has been received. Accept my thanks for the same. The latter paper I will return shortly as you may have use for it.

I examined the sample of cheese you kindly sent me, but failed to detect the presence of tyrotoxinon, either chemically or physiologically.

The examination of the cheese under the microscope showed the presence of a number of bacilli. I have had cultures made from these and propose in the near future to study their effect on milk.

Respectfully,

E. A. SCHWEINITZ.

CHEESE POISONING AT RAWSON.

August 21 the Ohio State Journal contained an account of the poisoning of eight persons at Rawson from eating cheese. I obtained from the Health Officer, who corroborated the report, all that was left of the cheese—about twenty-five pounds—and secured the names of the two attending physicians and of the manufacturer. The following report was received from one of the attending physicians:

RAWSON, OHIO, *September 1, 1890.*

Dr. C. O. Probst:

DEAR SIR: In reply to your request in reference to cheese poisoning recently reported from this place, would say that I only saw two cases alleged to have eaten cheese

and to be affected thereby. From what I observed in the cases, and also from the general evidence that developed itself, it was hardly probable that the sickness was caused by cheese. Several families ate of the cheese, but only a few children and children only, became sick from one to two hours after eating supper. The two cases which I saw were members of the same family and were attacked with pain in stomach and bowels and vomiting which lasted but a few hours. Other members of the family ate of the cheese but were not affected.

Very respectfully.

S. G. HERRINGTON.

It will be seen by this letter that Dr. Herrington was not inclined to believe that the cheese caused the sickness. The physician who treated the other cases failed, for some reason, to give a report of them, although repeatedly urged to do so. The Health Officer, however, was of the opinion that the cheese was accountable for the sickness.

The cheese was made by Mr. W. J. Eldridge, of Aurora, Ohio, who furnished the following report in regard to the method of its manufacture:

AURORA, PORTAGE COUNTY, OHIO, Sept. 4, 1890.

Hon. C. O. Probst, Secretary Ohio State Board of Health, Columbus, O:

DEAR SIR: Your letter of the 29th ult. received and noted. I sincerely trust that an analysis of the cheese will show no foundation of the sickness complained of, and will have to ask you to do me the favor of letting me know just what is shown by such analysis. It is the first time in my very long experience of cheese making that any such trouble or complaint has been made regarding my cheese. I sell cheese to Halle, Skall & Co., of Cleveland, O., branding same "La Belle Factory." I have several factories and also buy outside a great deal of cheese, and do not fill the orders to my customers out of the same factory every time I ship them, making same grade of cheese every time, so I can not really tell which factory this cheese is from. When I fill an order I always take the same day's make to fill it, and Halle, Skall & Co., must have had seven or eight more cheese of same make as the one you speak of; that is, made out of the same vat of milk. I do not see why one cheese out of a vat will make persons sick and the balance will not, and I do not believe any other cheese out of that shipment have or will make any person sick, and all are sold and gone into consumption. It is the very first cheese out of all I ever made or handled that I have ever heard of making persons sick. I take the milk twice per day and make one pound of butter off 150 to 200 pounds of milk, and make up the two milkings together. I use Ashton salt and the best rennet extract I can possibly get, and my process of manufacture is the same as factories in general, and I employ the very best cheese makers I can get. My stock of cheese is of a better grade than the Ohio Standard.

I can not state when the cheese was made, but presume from date of sale it must have been of an early July make. The cows furnishing milk supply to my factories have not been sick to my knowledge, nor to the knowledge of any of my cheese makers. I have made very careful inquiry for you since receiving your letter and I can not possibly find any reason at all for the trouble. I hope you will find that the cheese is all right, and if it is not I must earnestly ask you to let me know what the analysis shows. My factories are kept scrupulously clean, and I take a great deal of pride in my make of cheese. I shall be glad to hear from you again in regard to this, and answer as fully as I can any further questions.

Yours respectfully,

W. J. ELDRIDGE.

A sample of the cheese was given to Prof. Weber for examination, and another to Mr. Schweinitz. A third sample was given to Prof. Detmers for biological examination.

The following reports from Mr. Schweinitz and Prof. Weber were received:

Sample of cheese received of State Board of Health, September 10, 1890, marked cheese from Rawson, O.

Cheese examined according to Vaughan's method for tyrotoxinon, the results being exactly like those of former examinations of alleged poisonous cheese.

H. A. WEBER, *Chemist*.

U. S. DEPARTMENT OF AGRICULTURE, BUREAU OF ANIMAL INDUSTRY.

WASHINGTON, D. C., *Sept. 29, 1890.*

Dr. C. O. Probst, Columbus, Ohio:

DEAR SIR: The sample of cheese sent by you some time ago, was received and analyzed on August 28. My reply to both your letters, as well as my report upon the cheese, has been delayed by my absence from the city and press of work. As for the cheese—

The cheese, six pounds in weight, was cut into small cubes and extracted with distilled water. The acid extract was then neutralized with soda carbonate and extracted with ether, and the ether allowed to evaporate spontaneously. The water solution of the residue was treated as follows:

A few drops added to carbolic acid plus sulphuric acid, gave a slight yellow color to the mixture.

Ferric chloride plus K. Fy. gave Prussian blue reaction with a few drops of the liquid. A portion of the extract corresponding to about two pounds of cheese was given to two kittens, about two and one-half weeks old. Each kitten, therefore, received the extract equivalent to one pound of cheese. The kittens were not in any way affected.

A considerable quantity of the cheese was fed to the kittens without producing bad results. Consequently we must conclude that this cheese did not contain Vaughan's tyrotoxinon (?).

Yours, etc.,

E. A. SCHWEINITZ.

Our investigations have proved beyond question that "cheese poisoning" is at times, if not often, due to some substance other than tyrotoxinon. And furthermore, that the development of this poison, in our present state of knowledge is wholly beyond the control of the manufacturer. As but one cheese may be affected in a lot of ten or more made in the same vat at the same time, the formation of this poison evidently takes place after the cheese is put to press.

The most reasonable theory in regard to the character and formation of this poison is that it is a product due to the action of germs with which the cheese, in some manner, has been inoculated.

Since the above was written Prof. Vaughan has reported the discovery of a new poison in cheese, verifying our conclusions of two years ago, when we stated that tyrotoxinon is not always the cause of cheese poisoning.

In an article in the Medical and Surgical Reporter, published Nov. 22, 1890, he reported that samples of cheese, which produced no effect when fed direct to dogs and cats, was found to contain a poisonous substance belonging to the so-called poisonous albumens, which injected under the skin of cats produced invariably purging, vomiting and other symptoms seen in cheese poisoning.

REPORT OF AN INVESTIGATION OF THE SANITARY CONDITION OF
THE OHIO SOLDIERS' AND SAILORS' ORPHANS' HOME.

XENIA, OHIO, *February 10, 1890.*

To the Honorable, the 69th General Assembly of Ohio :

In compliance with House Joint Resolution No. 21, a Committee of the State Board of Health was appointed by the President, and proceeded at once to investigate the sanitary condition of the Ohio Soldiers' and Sailors' Orphans' Home, at Xenia, Ohio.

The committee respectfully submits the following report :

The epidemic which led to the investigation began September 28, 1889—two boys from Cottage No. 18, having developed diphtheria on that day, and both dying within a week.

The origin of these cases could not be positively determined. Diphtheria was present in Xenia at that time, and also in a house near the Home.

From September 28, 1889, to February 10, 1890, 142 cases of diphtheria occurred, and twenty-four children and one hospital nurse died from the disease or its complications.

About two weeks after the appearance of diphtheria, scarlet fever developed among the children, the first case being a child received at the Home a short time before it was taken ill. Fortunately this disease was exceedingly mild, there having been 240 cases with but a single death. Scarlet fever has now entirely disappeared. The diphtheria epidemic has greatly abated, though it still prevails to some extent, there having been three deaths from the disease within the past ten days.

For a proper understanding of the sanitary conditions existing there, it will be necessary to give a brief description of the Home and its surroundings.

The Home consists of a farm of 293 acres, situated one mile southeast of Xenia, on which are located some forty buildings, consisting of an administration building, with children's general dining-room attached, twenty old single cottages and four new double cottages, occupied by the children, two school houses, a chapel, industrial building, hospital, laundry and out buildings.

The administration building and the old cottages are placed in a line running east and west, presenting a frontage of about fifteen hundred feet. East of this line are the four new double cottages.

The cottages are two stories, and all of the buildings are of brick, placed on an elevation favorable for natural drainage. The soil is a clayey loam, underlaid with a gravelly sub-soil, and the ground water level, when measured, was eleven feet, three inches below the surface.

There are usually about nine hundred children at the Home, and one hundred and fifty employes.

HEATING AND VENTILATION.

The buildings are all heated with steam by direct radiation, a steam heater being placed in each room. The living room of each cottage is also furnished with a stove, to be used in severe weather.

The buildings are generally greatly overheated. On February 5, a moderately warm day, the temperature in the cottages was found ranging from 80° to 90° Fahr., and this was with several windows wide open.

A vital omission in this system of heating, as found at the Home, is the absence of any means of regulating the amount of heat sent to each room, it being impossible to shut off the steam when the rooms become too warm, and as a consequence the children live almost constantly in an overheated atmosphere, and are extremely sensitive to outdoor exposure. Catarrhal conditions of the throat and nasal passages are generally prevalent, and a number of children showed enlargement of the tonsils and congestion of the mucous membrane, conditions undoubtedly predisposing to diphtheria.

The heating of the hospital is especially defective. On November 20, a moderately cool day, the temperature in one ward, crowded with sick children, was 100° Fahr., while in a ward on the opposite side of the building, it was 55° Fahr. There is no way of admitting fresh air to the hospital wards, except by the windows, which are so located that the children are unavoidably exposed to dangerous draughts.

VENTILATION.

With but a few exceptions, there is practically no ventilation in any of the buildings. In the old cottages there are a few very small ventilators, but tests showed in most instances that no air was passing out of these openings, and in some cases, back currents were found.

The air was examined in the dormitories of Cottages Nos. 2, 3, 5, 21 and 24, between the hours of six and seven A. M., the rooms having been vacated from a half to three-quarters of an hour before. Bad odors were found in all, and especially in Cottage No. 24, which is one of the new cottages. Tests were made for carbonic acid, and from three to four times the amount allowable in respirable air was found. It is to be borne in mind that the carbonic acid found in occupied rooms is a measure of the organic impurities present in the atmosphere, coming from the lungs and bodies of their occupants.

The dormitories of the old cottages are thirty-three feet eight inches long, seventeen feet six inches wide, and eight feet nine inches high, giving an air space of 5,154 cubic feet. This space is diminished by closets and furniture at least one-tenth, leaving an actual available air space of about 4,641 cubic feet.

Each cottage contains sixteen beds, and usually thirty-two children; and in times past as many as thirty-seven children have been crowded into them. With the present number, thirty-two, each child has a breathing space of 145 cubic feet. This virtually means that each child is confined over night in a box six feet long, six feet wide and four feet high, and this box practically without ventilation.

The new cottages are somewhat larger, but are also entirely too small, as the dormitories contain an air space of but 212 cubic feet per capita.

SEWERAGE.

The sewerage system, in many respects, is to be commended. In the rear of the boiler-house is a tightly closed cess-pool of a thousand barrels capacity, into which the main sewer delivers the sewage from the entire plant. Leading from this cess-pool to the boiler-house smoke stack is a ten-inch pipe which effectually ventilates not only the cess-pool, but the entire sewerage system.

We had the main sewer opened at four different points, and found a powerful draught toward the cess-pool at each opening.

From the cess-pool the sewage is pumped daily to several fields, about a half-mile distant, where it is received in a number of reservoirs, from which it is allowed to flow over the land. Formerly, the sewage was discharged into a cess-pool, some distance northwest of the buildings, with an overflow into a creek, which runs through the town of Xenia. This old line of sewer still exists, and sewage is sometimes discharged in this direction. Sewage from the old school house is also discharged into this old cess-pool, which was found in a very foul condition.

PLUMBING.

The plumbing throughout, with but few exceptions, should be condemned.

The water closets are of antiquated pattern, long since discarded in sanitary plumbing, inefficiently trapped, and scarcely at all flushed after using. The iron soil pipe in each cottage ends just beneath the first floor, where it enters an 8-inch drain tile, the connection being made with a cement joint. This drain runs through the foundation wall at the rear of each cottage, where it joins the main sewer.

A break in this drain, which might easily occur from the settling of the foundation walls, or other cause, would saturate the ground under the cottages with filth.

The floors of the bath-rooms and water-closets in nearly all old cottages, were in bad repair, large cracks existing in the flooring, which would readily admit water and filth, when the rooms were being scrubbed. In cottages Nos. 1 and 4 the floors were torn up, and a large amount of filth was found under them. This adds considerably to the air pollution in the cottages.

WATER SUPPLY.

The water supply is derived principally from two sources, viz: A large well and a small creek running through the grounds. The well is a trench sixty feet long, five feet wide and twenty-four feet deep, dug in quick sand at the bottom of a hill, the water being pumped to a tower 800 feet distant, where it is stored in iron tanks.

This well furnishes a very limited supply of water; there is never more than three feet of water in it, and even in wet weather it may be pumped completely dry in thirty-five minutes. In the summer it is often dry for weeks at a time, and during August and September of last year it completely failed, during which time the only water furnished to the Home for drinking and all other purposes had to be taken from the creek.

A reservoir formed by excavation, is situated between the well and the creek—about twenty feet from the former and thirty feet from the latter. It is of an irregular shape, about 150 feet long, 100 feet wide and 4 feet deep at its greatest depth. This reservoir is filled from the creek through a channel controlled by a gate.

The well furnishes water for drinking and culinary purposes, and for water-closets, baths, etc., in most of the buildings.

The reservoir supplies the new cottages (except for drinking purposes), the laundry and several other buildings.

Separate lines of pipe run from the well and reservoir to the water tower, but by simply changing a valve at the pump house, water from the reservoir can be sent through the pipes leading from the well, thus supplying drinking water from the reservoir. Two hundred yards above the reservoir, on the edge of the creek, and outside of the Home grounds, is a slaughter-house; all offal and wastes from the slaughter-house are washed into the creek, while cattle and hogs have free access to it.

The slaughter-house yard was extremely filthy, old bones, manure, hair, etc., being in close proximity to the water's edge, while a number of hogs, confined in an extremely

offensive pen adjoining the slaughter-house, were seen feeding on the offal of slaughtered animals.

This creek becomes almost dry in hot weather, and it is sometimes difficult to secure water sufficient to fill the reservoir. Ice is harvested from the reservoir whenever possible, and is used for all purposes.

Samples of water were taken from the following sources and submitted to Prof. C. C. Howard, of Columbus, Ohio, for analysis:

Sample No. 1, reservoir water taken at the laundry.

Sample No. 2, well water taken from the tank.

Sample No. 3, well water (pump well) in rear of hospital.

Sample No. 4, well water (pump well) near industrial building.

His report is as follows:—

Dr. C. O. Probst, Secretary:

DEAR SIR: The four samples of water received by express from Xenia have been examined by me with the following results:

No.	Oxygen required.	Free ammonia.	Alb. ammonia.	Nitrous acid.	Chlo.
1	.10	.012	.015	trace	1.28
2	.08	.012	.010	trace	.85
3	.13	.006	.012	.001	3.20
4	.09	.005	.008	trace	1.85

(Parts to 100,000.)

An examination of these numbers shows that none of the waters are of excellent quality. Nos. 1 and 2 are so impure that they ought not to be used; and 3 and 4, though less objectionable, are of doubtful quality.

Yours respectfully,

(Signed)

C. C. HOWARD, *M. Sc.*

HOSPITAL.

The hospital is a two-story structure built in the shape of a cross, with a front and rear entrance connected by a hall running through the center of the building. It contains seven wards, a dining-room, kitchen, two matrons' rooms, an office and a reception room. It is impossible to enter the wards at the extremities of the building without passing through intermediate wards, and with two contagious diseases prevailing at the same time, as recently happened, it is utterly impossible to secure the necessary reparation. As a result, many patients will almost inevitably contract both diseases. The ventilation of the hospital is fully as bad as in the cottages, while the heating is infinitely worse.

In a Home of nine hundred children, subjected to outbreaks of contagious diseases, some provision should be made for the isolation of suspected cases. With the present hospital arrangements, it would not be safe to send a suspected case of diphtheria, scarlet-fever or small-pox to the hospital, if it contained children affected with other diseases.

A quarantine hospital, to which children with suspicious sore throats could have been immediately sent to await developments, would have been of inestimable value during this epidemic.

Finding several children in the cottages, possibly in the incipient stage of diphtheria, we issued the following order, No. 1:

RULES FOR THE PREVENTION OF THE SPREAD OF DIPHTHERIA AT THE O. S. AND S. O. HOME.

XENIA, OHIO, February 10, 1890.

RULE 1. There shall be fitted up at once detention wards for receiving all suspected cases of diphtheria, where such cases shall be immediately sent and kept under observation not less than fourteen days.

Suspected cases shall be received in ward No. 1, and shall remain there for the period of three days, when, if there are no distinctive evidences of diphtheria presenting, they shall be removed to ward No. 2, to remain until the expiration of the detention period. Then, after thorough cleansing and disinfection, they may be returned to their respective cottages, upon the approval of the physician.

RULE 2. Convalescent patients from the hospital, after being thoroughly bathed, disinfected and dressed in clean clothing, which has not been kept in the hospital, shall be sent to the convalescent wards and kept there for a period of ten days. At the expiration of this time they shall be thoroughly bathed and disinfected, dressed in clean clothing, and may then be returned to their cottages, upon approval of the physician.

RULE 3. The matrons shall inspect the throats of the children in their respective cottages twice daily; in the morning before breakfast, and in the evening before supper, and notice shall be immediately sent to the office of the superintendent of all cases of sore throat or other sickness found. Such inspection shall be made by using a spoon to depress the tongue, the spoon to be disinfected after the inspection of each child, by washing in a solution of bichloride of mercury, 1 to 1000, and wiping on a clean cloth, which shall be burned.

RULE 4. All disinfectants kept for use in the cottages or elsewhere shall be marked *poison*, and kept in a place secure from access by the children.

RULE 5. These rules shall be printed and copies posted in all the occupied buildings on the grounds.

By order of Ohio State Board of Health.

(Signed)

THOS. C. HOOVER,

E. T. NELSON,

C. O. PROBST,

Committee.

Approved: NOAH THOMAS, *Superintendent.*

C. M. GALLOWAY, *Physician.*

The children in cottages Nos. 1 and 4 suffered a greater mortality from diphtheria than those of any other cottage, there having been five deaths in the former and six in the latter. Cottage No. 1 had been vacated for many weeks, but the children belonging to cottage No. 4 had been taken out and returned on three different occasions, and each time they were returned the disease broke out among them. Especial attention was given by the committee to these cottages. The sewers and drains were dug up, the floors in water-closets and bath-rooms torn up, and the plumbing tested. Nothing was found to account for the excessive mortality in cottage No. 4. No. 1 occupies low ground, the rear end resting directly on the ground. As a consequence the walls are frequently very damp, and we were informed that at times the water could be seen standing in drops on the walls.

The following order, No. 2, was issued:

February 11, 1890.

Major Noah Thomas, Superintendent O. S. and S. O. Home, Xenia, Ohio:

SIR: In view of the fatalities from diphtheria in cottages Nos. 1 and 4, and of the repeated outbreaks in the same, we ask that the following precautions be taken before they are again occupied:

1. That all clothing, bedding and all other textile fabrics, and all pictures, books, toys and other articles, except chairs, tables, stands, stoves and bedsteads, be taken from said cottages and burned.

2. That all the floors be taken up and new ones laid, with leaded joints, and afterwards oiled with not less than two coats of oil.

3. That water-closets be torn out and replaced with approved modern closets, with a separate trap for each fixture.

4. That all ceilings, side walls, windows, woodwork and all chairs, tables, stands and bedsteads be washed with a solution of bichloride of mercury, of the strength of one to one thousand.

5. That each cottage be fumigated by burning not less than fifty pounds of sulphur, distributed proportionately to the sizes of the rooms, all openings having been previously closed.

6. That ceilings be lime washed, walls and woodwork painted, and chairs, bedsteads, tables and washstands varnished.

7. That cottage No. 1 be excavated under the rear part and drain tile laid near foundation walls to render them dry.

After these instructions have been complied with the cottages may be occupied by their respective families.

(Signed) THOS. C. HOOVER,
E. T. NELSON,
C. O. PROEST,
Committee.

We have endeavored in the foregoing pages to present to you the actual sanitary conditions found at the Home, and would sum up our conclusions as follows:

The overcrowded condition of the dormitories and the total lack of ventilation, together with a greatly overheated atmosphere on many occasions, make these cottages veritable hot-beds for propagating the germs of infectious diseases. A child with diphtheria sleeping with its companions under such conditions might readily infect the entire family. It frequently happened when the recent epidemic first broke out that from lack of hospital accommodations, infected children were associated with their companions from twenty-four to forty-eight hours before removal.

It is a well known fact that persons compelled to breathe an atmosphere polluted with the organic impurities of respired air, are rendered exceedingly prone to all infectious diseases, and are also more liable to succumb when so affected. So long as these children of the Home are subjected to the dangers of overcrowding, and are given such grossly impure water as is sometimes supplied, we may expect epidemic diseases to prevail among them. What can be said of supplying these children with water from a creek reeking with the filth of a slaughter-house, not 200 yards from the in-take? The constant cry last summer, we were informed was "water, water, water." None was to be had except from the reservoir, which was covered with a filthy scum, and this supply was so limited that men followed up the creek, opening out all the little stagnant pools, in their efforts to supply the demand. Is it a wonder that sickness has resulted? Looking at the twenty-four little new graves at the cemetery, the question arises, who is responsible?

While it is true that it is probably impossible to entirely prevent the introduction of infectious diseases in such a Home, it is also true that such diseases are preventable; and if the children had been living under healthful conditions, and proper isolation could have been given, the present epidemic could have been promptly stamped out.

The hospital is entirely unsuited for epidemic emergencies. In the beginning of this epidemic the wards were rapidly filled with sick and dying children, and those already in the hospital for other diseases were exposed to all the dangers of intimate association with diphtheria, and scarlet fever patients.

On visiting the hospital on the night of November 20th, it was found to be excessively overcrowded. In one ward, filled with sick beds, the atmosphere was stifling—the temperature 100° F., and yet, on account of the arrangement of the windows, it was impossible to admit a breath of fresh air, without exposing the patients to dangerous draughts. Physicians and nurses could not avoid free mingling with both the scarlet fever and diphtheria patients, and a proper separation of these diseases was impossible. The children at that time had become almost panic stricken, and an order to be sent to the hospital produced almost the effect of a death warrant.

Owing to the abominable construction of the hospital, the bodies of those who died had to be carried out through wards occupied by sick children, and at least one death occurred in a convalescent from the shock produced by such a sight.

The hospital at this time became a veritable death-trap; the superintendent refused to allow another child to be taken into it; and it became necessary to vacate some of the cottages and utilize them and the school-house and industrial building as convalescent and quarantine wards.

We would urgently recommend to your honorable body that the following additions and changes be made:

1. The overcrowded condition of the cottages should be relieved as soon as possible for reasons already given.

2. Changes should be made in all the heaters so that the amount of heat sent to each room can be regulated.

3. Provisions should be made for the constant and thorough ventilation of each cottage.

4. The old line of sewer used mostly for an overflow of rain water, and the cess-pool into which it discharges, should be abandoned and dug out. The rain water, now lost by discharging through this sewer, could be stored and utilized.

5. Most of the plumbing in both old and new cottages should be torn out and replaced with that of approved modern pattern. The soil pipe should be carried full size through the roof, and the tile house drain replaced by iron pipe carried beyond the foundation walls. The floors in the water closets and bath rooms in the old cottages should be torn out and replaced with new water-tight floors.

6. An additional supply of drinking water should be secured, and it should be made impossible to fill the drinking water tanks with water from the reservoir. The pump wells on the grounds should be filled up. Ice should not be collected from the reservoir for any purpose.

7. A new hospital for general diseases should be built at once. It should have not less than 150 beds, and should be constructed on modern approved plans.

The present hospital should be remodeled by dividing the larger wards and providing a separate entrance to each, and used as a quarantine hospital. The heating of each ward should be arranged so as to be properly regulated, and provision for increasing the ventilation of each ward should be made.

Our committee is under many obligations to the officers and employes of the institution, all having joined in affording us information and assistance in our investigation.

Respectfully submitted,

(Signed)

THOS. C. HOOVER,
E. T. NELSON,
C. O. PROBST,

Committee.

SECOND INSPECTION OF THE OHIO SOLDIERS' AND SAILORS' ORPHANS'
HOME AT XENIA, AUGUST 30, 1890.

It was deemed advisable to make a second inspection of the Ohio Soldiers' and Sailors' Orphans' Home to learn whether the changes recommended by the Board at its first inspection had been carried out. Accordingly this institution was visited August 30th. Gen. Sherwood, of Canton, a member of the Board of Trustees, was present at the Home, and accompanied us on our tour of inspection.

We are pleased to report that a very great improvement has been made in the sanitary condition of this institution. The plumbing, which was found in such bad shape, has been thoroughly overhauled, and new tank water closets of approved pattern have been put in all of the cottages and the main building. The floors in the bath rooms and wash rooms of the cottages, which were previously found in such bad repair, have been relaid with hard wood laid with leaded joints. In cottages 1, 4 and 14, where diphtheria was the worst, new floors have been laid throughout. Cottages 1 and 4, which at our first inspection were found resting directly on the ground, and consequently very damp, have been excavated underneath and properly drained. These cottages are now in good condition. A regulating valve has been placed on the heaters of each cottage, and each supplied with a thermometer, so that the temperature of all cottages can now be regulated.

Two new cottages are in course of construction, and this will greatly relieve the over-crowding which prevailed to such a dangerous extent at the time of our first visit.

The Board of Trustees have adopted a rule that not more than thirty children shall occupy any one cottage. New single beds are being purchased, and as soon as possible the double beds will be done away with.

Two rooms have been fitted up in the old industrial building for cases of infectious diseases, should any unfortunately occur. Plans have been accepted for a new hospital, which will be built on the cottage plan, with one cottage set apart for contagious diseases. The site for the hospital is some distance from all other buildings, and is well adapted for the purpose.

A proposal has been accepted from the National Pure Water Company, of Cincinnati, to furnish the Home with water. The Wagner steamed Filter wells, similar to the ones in use at the Dayton Soldiers' Home will be put down, and nothing will be paid unless a satisfactorily pure water is found.

Five man-holes have been made connecting with the main sewer, so that it can at all times be under inspection. These man-holes will be kept tightly closed, so as not to destroy the ventilation of the soil pipes, which is accomplished by means of the smoke stack of the boiler house.

Dr. T. Van Dupuy, formerly physician at the Dayton Soldiers' Home, has been appointed resident physician, and has now taken charge. He reported September 10th one case of typhoid fever at the Home, imported from Hamilton.

From the foregoing it will be seen that the recommendations of the Board, embodied in its report to the legislature, have been faithfully carried out, and as a result, the institution is, or soon will be, in excellent sanitary condition.

REPORT OF A SANITARY INSPECTION OF THE BOYS' INDUSTRIAL SCHOOL,
LANCASTER, OHIO.

An inspection of the Boys' Industrial School was made July 17, 1890.

This institution is located about five miles from Lancaster. Placed on an elevation overlooking the surrounding country in all directions, the buildings are freely exposed

to winds, which are tempered by forests, and made fragrant by the numerous pines growing among them. Natural drainage of the surface is secured in all directions, while the system of sewerage carries quickly and to a great distance, all wastes from the buildings.

The water supply, taken from springs located at a distance from the buildings, and from one driven well, is of great purity and of a pleasing softness. The buildings are of brick, in good repair, and were found in a scrupulously clean condition throughout. The water closets were clean and well kept, and comparatively free from odor, but they are the old style pan closets, with unventilated traps, and fail to meet the requirements of modern plumbing. Most of these closets are in unventilated rooms opening into dormitories, and are consequently a source of considerable danger to the inmates. We would advise that they be replaced with approved tank closets as soon as possible.

The heating of all buildings, except the Ohio building, is by direct radiation, steam coils being placed in the rooms to be heated. There is practically no means for ventilation except by doors and windows, and under such circumstances this is the worst system that could be adopted.

At a small expense ventilating shafts, heated by gas, could be placed in the dormitories, which would greatly improve their ventilation.

The Ohio building is heated by two small furnaces, which are entirely too small for the work required of them, and they must of necessity be frequently overheated in cold weather, thus supplying a bad quality of air. In addition, the cold air ducts supplying the furnaces with fresh air, are of wood, and their joints were found widely open in many places. As these ducts run through the basement, they must necessarily draw a part of their supply from the basement air.

New furnaces with metal air ducts, should be placed in this building.

The privies are located in the rear of each family building, and have shallow vaults for receiving excrement. These will always be more or less of a nuisance, and we would recommend that they be replaced by water tight boxes placed under the seats to receive the deposits, which must be kept constantly covered with fine, dry earth. If this is properly done, all bad odors will be removed and a valuable manure will be secured. We would suggest that the moral cleanliness of the boys would seem to require their greater separation when at closet, and these should be partitioned off into single apartments.

The hospital is a separate building, of ample capacity, which could easily be adapted for the separation of cases of contagious diseases. We found one case in the hospital pronounced diphtheria by the attending physician, and a suspected case that had been sent there for detention. The following is a copy of the directions given to the Superintendent, Mr. Hite, for the care of these cases:

LANCASTER, O., July 18, 1890.

Mr. J. C. Hite, Superintendent, Lancaster, O.:

DEAR SIR: We respectfully present the following directions for the prevention of the spread of diphtheria at the Boys' Industrial School:

The boy now in the hospital, suffering with diphtheria, must be kept strictly isolated from all but the physician and the necessary attendants. The attendants must not be allowed to come in contact with other children, nor with adults, without first thoroughly disinfecting the whole person and making a complete change of apparel.

Discharges from the bowels and bladder, and from the throat and nose of the patient, should be received in a vessel containing a solution of corrosive sublimate—four drachms to the gallon of water—cloths used for receiving discharges must be immediately burned. All dishes, glasses, cutlery, etc., used by the patient, must be boiled at least 30 minutes after using, and kept separate from those used by other persons.

All wash-clothing and bed-linen used by the patient or his attendant must be immersed in a corrosive sublimate solution—two drachms to the gallon—for two hours before

being taken from the hospital, and then boiled for one hour before being put into the wash.

Diphtheria patients must be detained in the hospital for at least two weeks after the disappearance of all throat symptoms. Prior to discharge from the hospital, they must be bathed from head to feet in a solution of corrosive sublimate—1 drachm to the gallon—and then with soap and water. They must then be dressed in fresh clothing that has not been kept in the hospital.

In case of death the body must be completely enveloped in a sheet saturated with a solution of corrosive sublimate—4 drachms to the gallon—placed in a tight coffin, and be buried at once. After vacation of the rooms occupied by a diphtheria patient or his attendant, they should be disinfected as follows:

Close the rooms tightly, stopping all cracks and crevices. Arrange bedding, clothing, etc., which can not be boiled, so as to present the greatest possible surface to the action of the sulphur fumes. Place in an iron vessel in each room, not less than three pounds of broken sulphur to each 1,000 cubic feet of air-space, and this vessel in a tub containing six inches of water. Moisten the sulphur with alcohol, ignite, and quickly leave the room. Allow the rooms to remain closed for 24 hours, and then thoroughly air them. Afterwards wash all walls, floors, ceilings, windows, other surfaces, and all wooden furniture with a solution of corrosive sublimate—four drachms to the gallon. After 24 hours, wash the same surfaces with soap and hot water and then thoroughly air the rooms.

Label all solutions POISON and keep secure from all persons except those authorized to use them.

Signed, THOS. C. HOOVER,
C. O. PROBST,
Committee.

DIRECTIONS TO BE FOLLOWED BY OFFICERS ON THE OCCURRENCE OF DIPHTHERIA OR OTHER CONTAGIOUS DISEASE.

LANCASTER, O., *July 18, 1890.*

Any person complaining of sore throat, fever, headache, or other symptom of diphtheria or other contagious disease, shall be immediately sent to the detention ward, there to remain isolated until the nature of the sickness can be determined.

Signed, THOS. C. HOOVER,
C. O. PROBST,
Committee.

J. C. HITE, *Superintendent.*

REPORT OF A SANITARY INVESTIGATION OF THE GIRLS' INDUSTRIAL HOME, DELAWARE, OHIO.

An inspection of the Girls' Industrial Home was made by your committee on August 23, 1890.

This institution is located on the banks of the Scioto river about ten miles from Delaware, and consists of a farm of 180 acres, a central administration building, eight cottages for girls and their officers, four or five houses for employes, and the usual number of out-buildings. The buildings are pleasantly situated near the brow of a considerable hill which slopes rather abruptly to the river bottom. The soil is a clayey loam over-lying a lime stone formation which, in many places, is quite near the surface.

BUILDINGS.

The central building and family cottages are substantial two-story brick buildings, separated by a considerable space. The plan of the cottages, excepting cottage No. 8, is in general the same. A basement, imperfectly ventilated and lighted, extends under the entire building. The first floor is devoted to a reception room, school room, one or more assembly rooms, dining room, kitchen, bath, lavatory and pantries. A front and rear entrance lead to the second floor, which is divided into sleeping rooms, a separate room being given to each inmate, except that a larger dormitory with four or five beds is provided for the use of small children. An officers' water closet and a wash room is located on this floor. Each bed room has a window opening to the outer air and a transom over the door opening into the hall, and is furnished with a small bureau, single bed and chair.

The school rooms are of good size with desks to accommodate about fifty pupils. An abundance of light is admitted to each room, usually from behind and from both sides.

The buildings were all clean, the water closets well supplied with water and free from odor. A complete absence of the disagreeable odor usually found in public institutions was noticable. This was attributed by the Superintendent, Col. Crawford, to the sparing use of soap in cleaning floors.

The basements of many of the buildings were decidedly damp, and none of them are cemented or drained. One of the cottages is built immediately over a deep ravine which was filled for the purpose, and this building was especially damp.

The new cottage, No. 8, is larger, lighter and more cheerful than the old cottages, but most of its dormitories are too small. A transom fitted with wire is placed over each bed room door, and this helps the ventilation to some degree. We most heartily commend the plan of giving to each girl a private room.

HOSPITAL.

The hospital is a modern frame structure, located at some distance from all other buildings. It is well lighted and ventilated, and most of the rooms have open fire places. Steam coils (direct radiation) are used for additional heating purposes. It contains twenty-four beds, placed in rooms cut off from each other and opening into a central hall. It is fitted up complete with kitchen, dining room, bath and water closets, and is well adapted for caring for cases of contagious diseases. The plumbing is modern and in good repair.

EMPLOYEES' HOUSES.

The employes with families are given houses variously located about the grounds. One of these, known as the "Burnett House," is a dilapidated old frame building with a history of there having occurred in it a number of cases of typhoid fever, three of them within a short time. This house is located near the foot of a hill, and its foundation doubtless intercepts a large amount of filth, and is always more or less damp. The other houses for employes are in good condition, and a model cottage for this purpose is being built. We should not neglect to mention that a very excellent stable is provided for stock.

HEATING AND VENTILATION.

The buildings are all heated by steam by the system of direct radiation. This method of heating as here used, without providing for the admission of fresh air, or the withdrawal of foul, is probably the worst that could be adopted. With windows and doors tightly closed, the air of the rooms is simply heated over and over again.

SEWERAGE.

The main sewer is built of tile twelve inches in diameter, and of uncemented rock. The tile sewer runs behind the cottages and central buildings, and then making a turn, extends down the hill towards the river, joining the rock sewer some distance below the cottages. Near the bottom of the hill the sewer empties into an open drain roughly lined with rocks, which conveys the sewage to the river. This drain was partially obstructed with an overgrowth of grass and weeds. A second short line of main sewer, connecting with one cottage and the hospital, empties into the river some distance below where the other discharges. It also is built of twelve-inch tile with the lower part of uncemented rock.

Formerly each cottage was furnished with water closets for officers and children, but an outbreak of typhoid fever occurring which was attributed to the escape of sewer gas into the cottages, the closets for the children were abandoned. The lids of these closets were nailed down, and the bowls, we were informed by the Superintendent, were sealed with plaster of paris. The officers' closets were allowed to remain.

About forty feet in the rear of each cottage a privy is built over the main sewer. Upright pieces of sewer pipe having a constriction at the lower end are fitted to the crown of the main sewer, from eight to ten openings being made in each privy. No traps are provided for the bowls. Waste water from the cottages, main building and laundry empties into this sewer, and in addition the closets are flushed each day. It is proposed to run a pipe from the water tower to the head of this sewer so that it can be thoroughly flushed each day. The closets were all clean, and bad odors were not specially noticeable.

WATER SUPPLY.

There are two sources of water supply. One is a white sulphur spring which is used for drinking and cooking purposes. This water was obtained at a depth of 180 feet in boring for salt in the bed of the Scioto river, and is a true artesian supply, being forced from the well to a point fifty feet or more above, where it flows in a large and constant stream into a marble bowl provided for it. The overflow works a hydraulic ram which forces about one-sixth of the overflow to a fountain in front of the main building. The water is a little unpleasant to those not used to it, but is undoubtedly of great purity. Perhaps the only objection to this supply is the fact that it must be carried a considerable distance, thus increasing the possibility that river water from the hydrants will sometimes be drunk by the children.

Water for all other purposes is supplied from a well hole in the Scioto river a short distance above the point where the main sewer discharges. The water is pumped through an iron pipe to an old filter bed composed of boulders, sand and gravel, passes through the filter to a well from which it is pumped to a water tower above and back of the cottages.

RECOMMENDATIONS.

We are pleased to note that the present condition of the school is most excellent. No sickness was found and the inmates presented a clean, well-fed appearance. But as it is certainly better, and also more economical, to prevent sickness than to cure it, we respectfully recommend that the following changes be made :

BUILDINGS.

The basement floors of all cottages should be laid in cement or asphalt, and in some cottages tile drains should be laid to relieve the foundation walls of dampness. The location of the buildings, with high land above them, and the character of the soil on which they are located, have a tendency to flood the foundations with water, and without precautions of this kind damp walls and damp houses must often result. Such

dampness is always injurious to health, and affords one of the conditions underlying the origin of epidemic diseases.

It would be well to abandon the old "Burnett House" for dwelling purposes.

PLUMBING AND SEWERAGE.

Special care should be given to the plumbing in the cottages, and especially to that connected with the abandoned water-closets. It would be much safer to entirely remove these unused fixtures, and all waste and vent pipes connected with them rather than to trust to filling the bowls with plaster of paris for the exclusion of sewer gas. As soon as possible the old style pan-water closets now in use should be replaced with approved tank closets. Placing the children's closets out of doors has undoubtedly lessened the danger arising from defective plumbing, but sewer gas can as readily gain entrance through officers' closets, and as the plumbing is all very old it will require a constant and intelligent oversight to avoid danger.

The children's out-door closets contain from eight to ten bowls in each closet, and as these are all in one room there is not that provision for privacy that refinement calls for. We suggest that each bowl should be separately inclosed. The same criticism, to some extent, is perhaps applicable to the bath rooms, which contain two or more tubs. In some of these sheets were hung between the tubs. A wooden partition would be much better.

We heartily approve of the plan of bringing water from the water tower to flush the main sewer daily. The man-holes in the lower part of this sewer, now closed, should be kept open for additional ventilation. It would be advisable to tear out the uncemented rock sewer and continue the 12-inch sewer pipe to the river. It would be well, also, to carry the out fall of this sewer further down the river. The possibility of utilizing the sewage for manurial purposes should be entertained, as it would be an easy matter to distribute it to crops grown on the bottom land.

WATER SUPPLY.

This is, perhaps, as good as could be desired. No dependence should be placed upon the filter through which the river water is filtered, however, as a filter of this kind, never cleaned, but adds impurities to the water passing through it, and all persons about the Home should be cautioned not to use the hydrant water for drinking purposes.

HOSPITAL.

We learned with pleasure that it had not been necessary to use the hospital for a long time, but wish to call attention to a possible danger arising therefrom. The water-seals in the traps of closets, baths, washstands, sinks, etc., are liable to be evaporated when these are not used for many weeks.

Twice a week the hospital should be thoroughly aired, and water allowed to run for some time through all plumbing fixtures. As the hospital is to be used for cases of contagious diseases, we would recommend that all walls and ceilings should be painted and the floors thoroughly oiled, the cracks having first been filled with white lead or putty. This will make it easier to keep the hospital clean, and will make disinfection more certain, when this becomes necessary.

REPORT OF A SANITARY INSPECTION OF THE OHIO INSTITUTION FOR
THE EDUCATION OF FEEBLE-MINDED YOUTH, COLUMBUS.

An inspection of the Imbecile Asylum was made in September. This asylum is composed of substantial brick buildings, placed on a considerable elevation two miles west of Columbus. The present capacity is 850, but additions are now being made which will somewhat increase this.

HEATING AND VENTILATION.

All rooms are heated by steam, both the direct and indirect systems being used. In the system of indirect radiation steam coils, inclosed in metal boxes, are placed in the basement, fresh air from out of doors being admitted to wooden air chambers placed below the inclosed coils, to which the air is conducted through metal pipes furnished with valves to regulate the supply. Hot air flues placed in the walls lead from the coils to the rooms above. In addition to this nearly all rooms are furnished with steam coils for direct heating. Immediately behind these coils are openings to the outer air, about 2'x6'', covered with two perforated metal sheets. Many rooms, in addition, have open fire places, but these are seldom used.

VENTILATION.

In addition to the openings behind steam coils and open fire places found in most rooms, each room is provided with one or more foul air registers, which in all cases are equal in size to the fresh air openings. These open into foul air ducts which in most part are carried along hall-ways down to the basement, where they all connect with an underground tunnel which opens into a high ventilating stack at the pump house. A large exhaust fan is placed at the bottom of this shaft which causes, even in warm weather, a continuous and strong upward current.

SEWERAGE AND PLUMBING.

The main sewers, 14'' in diameter, empty into two large, tight cisterns, provided with catch-basins. The sewage flows by gravity from these into a well at the pump house, and is pumped into the Scioto River below the Harrisburg bridge, a considerable distance from the asylum. The same well also receives the sewage from the Insane Asylum, which is pumped into the Scioto River through the same line of pipe.

PLUMBING.

The plumbing throughout was found in good repair. Most of the water closets have an automatic flush; others are provided with a tank flush operated by seat pressure. A good strong flush was found in all closets, and these were all clean and mostly free from odor. The urinals are also provided with an automatic flush, and are furnished with lead-lined safes and sides.

Soil pipes in all cases extend full size through the roof. All fixtures are trapped, and traps are also placed on all main drains.

In the underground tunnel spoken of is a large metal pipe connecting with the sewerage system, and opening into an iron smoke-stack from the boilers, the stack extending through the ventilating shaft to several feet above it. To give further assurance of a constant ventilation of the sewerage system, an exhaust fan run at high speed, is placed in the metal pipe before it enters the smoke-stack.

WATER SUPPLY.

There are two sources of water supply; one from filtering galleries placed in the Scioto River bed, and the other from a large well sunk upon grounds. Both sup-

plies are pumped into storage tanks in water towers. The well water is used exclusively for drinking and culinary purposes, while the river water is used for all other.

HOSPITALS.

There are two two-story brick hospitals; one for males and the other for females. These are heated by direct radiation, and the fresh air openings spoken of as having been found behind the steam coils are here omitted. The hospitals are not connected with the general system of ventilation, but this will soon be done. Neither of the hospitals are suitably adapted for the isolation of cases of contagious diseases.

RECOMMENDATIONS.

We take pleasure in reporting that but few changes are required in the sanitary arrangements of this institution. We would suggest that as the wooden fresh air chambers in the basement depend upon perfect joints to exclude basement air from the general circulation, it would be advisable to use metal air chambers instead.

The hospitals are not provided for supplying a sufficient amount of fresh air. The amount per capita for hospital patients should be considerably in excess of that allowed for the well, while the reverse of this is here true. This will be but partially remedied by contemplated changes.

In addition to the present hospital accommodations some provision should be made for the isolation of cases of contagious and infectious diseases. By far the best plan would be a separate infectious disease hospital. The present rules for admissions require that a physician's certificate of the absence of danger of infection shall accompany each child, but in spite of this there is always danger that cases of this kind will be admitted.

It would seem to be the duty of the State to furnish isolation hospitals for each of the State institutions for children, for by so doing it will always be possible to prevent any serious spread of communicable diseases among the inmates.

REPORT OF A SANITARY INSPECTION OF THE OHIO INSTITUTION FOR THE EDUCATION OF THE DEAF AND DUMB.

An inspection of the Deaf and Dumb Asylum was made September 5. This Institution is located on east Town street near the central part of Columbus. The sanitary arrangements of the building are as follows:

HEATING AND VENTILATION.

The heating of most rooms in the building is by indirect radiation, steam coils being placed in the halls or rooms of the basement floor, hot air ducts leading to the rooms to be heated. The coils are inclosed in tight metal jackets to cut off basement air, and draw their supply of fresh air from a common central air duct leading to the outer air. In addition to this method of heating, direct radiation is used to some extent, the entire school building proper being heated by steam coils placed directly in the rooms. Open fire-places are also provided for some of the rooms, but are seldom or never used.

VENTILATION.

In addition to window ventilation, each room is provided with one or more registers opening into foul air ducts. The foul air ducts from all rooms lead to a common foul

air gathering room connecting with an underground tunnel, which leads to a ventilating stack, in the center of which is placed the smoke flue from the boilers.

LIGHTING.

The majority of the rooms are fairly well lighted, though some of the school rooms and study rooms are entirely too dark. In the basement, which is above ground, there are five school rooms, all small and poorly lighted.

PLUMBING.

The plumbing throughout is of the worst possible construction and is in very bad repair. The water closets are either the old style pan-closets, or tank-closets with a seat flush. In nearly all the flush was found to be insufficient and many of the bowls were very dirty. The closets adjoining the boys' dormitory were especially bad and a decidedly bad odor was present in the room containing them.

Many of the water closets are in rooms opening directly into dormitories, and are doubly dangerous on this account.

The plumbing of some of the stationary wash stands is exceedingly bad and dangerous. The waste pipes from some of these fixtures, a lead pipe two inches in diameter, is inserted into a Y branch of the soil pipe four inches in diameter, the connection being made with a putty joint. In some of these there was no trap, thus allowing the free access of sewer gas to the wash rooms, which, in some places open directly into dormitories. A more dangerous condition can scarcely be imagined.

In the basement a closet was found constructed with a metal trough covered with a seat provided with some eight or ten holes. A small trickling of water was flowing through it, not sufficient to remove the feces deposited there, and a very bad odor was found arising from it.

In some of the bath tubs the waste was very sluggishly removed, so that trouble was experienced in preventing children bathing in water that had been already used. To prevent this these tubs were closed over with boards, and as no provision was made to close the waste pipes, the water seals have doubtless long since evaporated, thus allowing a free access of sewer gas at all times.

WATER SUPPLY.

There are three sources of water supply. The roof water is collected in a number of cisterns, and is used for various purposes. Holly water from the Columbus water-works is placed in the building and out of doors, but is used only for fire purposes. For drinking, cooking, bathing, and for water closets, water is supplied from an open dug well. This well is located in the basement of the pump house, and is about 14 feet deep and 8 feet in diameter. It is covered with loose boards and is very insufficiently protected from the dirt of the pump house. It is said to be exhausted with difficulty with two steam pumps, and has not been cleaned for some time. During the past summer it was occasionally low, and the water quite roily at times. Water is pumped from this well into three iron tanks placed in the attic, and holding about 9,000 gallons. This attic is unplastered, very dirty, and is connected by an unclosed door-way with an attic over the chapel. Opening into this attic is a ventilator in the ceiling of the chapel, placed over a gas chandelier. A small opening in the roof of the attic is made for the escape of foul air. Great danger exists here of the water becoming polluted by the foul air, and it is also possible that the germs of a contagious disease, carried into the attic from the chapel, might be disseminated by means of the water supply.

The overflow from these water tanks is properly into cisterns or into open courts, and has no connection with the sewers.

Two samples of water were collected for analysis. One from a hydrant in the main hall in common use, the other from the storage tank. These were submitted to Prof. Weber, who reported as follows:

Samples of water received by State Board of Health, September 10, 1890, marked: Drinking water, first floor.

Parts of organic matter in 1,000,000 parts of water..... 16.5

Chlorine excessive.

The amount of organic matter is not very high, still the amount of chlorine present would indicate sewage contamination.

2. Sample of water received at same date as above, marked storage tank in attic.

Results the same as above.

H. A. WEBER, *Chemist.*

RECOMMENDATIONS.

VENTILATION.

The ventilation of all rooms could be greatly improved by placing a large exhaust fan near the base of the ventilating stack. This has been done at the Imbecile Asylum, where the system of heating and ventilation is on the same principle, and it works most admirably. This fan will insure a constant removal of the foul air regardless of outside temperatures or the direction of winds.

PLUMBING.

The whole system of plumbing should be thoroughly overhauled and much of it discarded. Pan closets should be abandoned, and tank closets put in instead. Most, if not all of the tank closets with a seat flush will also need to be replaced with new ones of a modern pattern. A thorough inspection of all soil and waste pipes, traps and fixtures should be made, and the entire system be tested for leakage. No untrapped fixtures should be allowed, and all joints should be made air tight. Fixtures not in use should be torn out and their waste and vent pipes tightly closed. The wood work with which nearly all fixtures are surrounded should be removed, and all inclosed spaces thoroughly cleaned. It is much better to have all fixtures freely exposed to light and air.

During vacation a number of closets, baths, etc., are out of use for two months or more, and there is danger of water seals in traps becoming evaporated. Once a week all unused fixtures should be flooded with water, and prior to the children's return from vacation all rooms containing plumbing fixtures should be thoroughly aired for several days.

WATER SUPPLY.

The presence of an excessive amount of chlorides in the well water makes it extremely probable that it is subjected to sewage contamination, and from the results of chemical analysis, and also from the position and character of this well, we feel justified in strongly urging that the use of this water for drinking or domestic purposes should be permanently abandoned. As the city water is already in the building, and is a much safer supply, a change can very readily be effected.

ANNUAL REPORTS OF LOCAL BOARDS OF HEALTH FOR THE YEAR ENDING OCTOBER 31, 1890.

ABERDEEN—DR. J. W. GUTHRIE, H. O.

Improvements in sewerage. None. Have natural drainage.

Nuisances abated. None.

What has been done to control the privy-vault nuisance? Disinfection.

Hog-pens within corporate limits? 100.

Slaughter-houses? None.

Dairies and milk supply inspected? No dairies.

School-houses inspected? Yes, and would be condemned, but new one is under contract.

Number of cases and deaths from infectious diseases. None.

ADA—W. H. MORROW, H. O.

Improvements in sewerage. None.

Nuisances abated. 50 privy vaults; 20 hog-pens.

What has been done to control the privy-vault nuisance? Nothing.

Hog pens within corporate limits? 50.

Slaughter-houses? None.

Dairies and milk supply inspected? Yes.

School-houses inspected? Yes, every week, and find them in good condition.

Number of cases and deaths from infectious diseases: Diphtheria, 6 cases, no deaths; scarlet fever, 4 cases, no deaths; typhoid fever, 4 cases, 2 deaths.

What was done to prevent their spread? A very strict quarantine. We were successful in confining it to the houses where it developed. There was only one family that objected to our restrictions.

AKRON—DR. A. A. KOHLER, H. O.

Improvements in sewerage. One and one-half miles of main sewer built. 200 house connections.

Nuisances abated. 3,000. The character: Wells abandoned and filled up; cess pools built, cleaned and abandoned; dead animals buried; streets and property cleaned, etc.

What has been done to control the privy-vault nuisance? The law of the State Board of Health has been adopted. 200 cleaned, abandoned or connected with sewer. 575 new vaults built.

Hog-pens within corporate limits? 50.

Slaughter-houses? None.

What was done to remove or control these? Ordinance passed and enforced removing them outside of corporate limits.

Dairies and milk supply inspected? Yes.

School-houses inspected? Yes.
Number of cases and deaths from infectious diseases: Diphtheria, 37 cases, 19 deaths; scarlet fever, 43 cases, 3 deaths; typhoid fever, 7 cases, 7 deaths; measles, 234 cases, 10 deaths; whooping cough, 23 cases, 23 deaths. Doctors do not report all cases of typhoid fever and whooping cough.

What was done to prevent their spread? Placarded the house and quarantined the family. Disinfected the house, bed-clothes, etc., after recovery or death.

ALLIANCE—DR. JAMES BATES, H. O.

Improvements in sewerage. None.

Nuisances abated. About 125. Privies, alleys, back yards, pig-pens, cow sheds, barns, slaughter-houses, manure piles, stagnant pools, etc.

What has been done to control the privy-vault nuisance? Compel persons having such to have them cleaned at once. No vaults unless of brick well cemented.

Hog-pens within corporate limits? Not more than 3.

Slaughter-houses? None.

What was done to remove or control these? When considered a nuisance they were ordered abated.

Dairies and milk supply inspected? They have been inspected—both cows and milk.

School-houses inspected? The health officer visited every school in the city.

Possible number of cases and deaths from infectious diseases: Diphtheria, 30 cases, 8 deaths; scarlet fever, 50 cases, 5 deaths; typhoid fever, 15 cases, 8 deaths; measles, 40 cases, 2 deaths; whooping cough, 20 cases, 1 death.

What was done to prevent their spread? In cases of scarlet-fever and diphtheria cards have been displayed on houses, the family prohibited from attending school or other public place.

ANSONIA—DR. H. A. SNORF, H. O.

Improvements in sewerage. Have surface drainage.

Nuisances abated. 200 privy-vaults cleaned during the year, and new ones constructed that are perfectly water-tight.

What has been done to control the privy-vault nuisance? All vaults shall be cleaned at least once a year, and at such other times as the Board may direct.

Hog-pens within corporate limits? Very few—not more than a dozen.

Slaughter-houses? None.

What was done to remove or control these? Board allows none to become in any way offensive.

Dairies and milk supply inspected? Yes.

School-houses inspected? Yes.

Number of cases and deaths from infectious diseases: Scarlet fever, 7 cases, no deaths; typhoid fever, 1 case, no death.

What was done to prevent their spread? Houses placarded and family isolated.

ASHLAND—R. A. DAVIS, H. O.

What has been done to control the privy-vault nuisance? Cleaned out.

Hog-pens within corporate limits? A great number.

Slaughter-houses? 4.

What was done to remove or control these? They have been inspected and disinfected.

Dairies and milk supply inspected? Yes.

School-houses inspected? Yes.

Number of cases and deaths from infectious diseases: Typhoid fever, 15 cases, 2 deaths.

BAINBRIDGE—DR. L. F. HOUSE, H. O.

Improvements in sewerage. A civil engineer is now surveying this village to establish a grade for sewerage.

Nuisances abated. None.

What has been done to control the privy-vault nuisance? Nothing, only what the health officer could do. No action by the Board of Health.

Hog-pens within corporate limits? 30.

Slaughter-houses? 3.

What was done to remove or control these? Nothing this year.

Dairies and milk supply inspected? No dairies. No milk inspected.

School houses inspected? No.

Number of cases and deaths from infectious diseases: Diphtheria, 2 cases, no deaths; typhoid fever, 5 cases, 3 deaths; whooping cough, 30 cases, no deaths.

BEDFORD—II. O. COURTNEY, H. O.

Nuisances abated, 1. Carp pond, pond of stagnant water.

What has been done to control the privy-vault nuisance? Close watch kept over all and have them cleaned out.

Hog pens within corporate limits? None.

Slaughter houses? None.

What was done to remove or control these? By village ordinance making it an offense for the same to be within the incorporated limits.

School-houses inspected? School-house and school yard frequently inspected; we have good school-house and good ground upon an elevation of ground where it is dry and nice.

Number of cases and deaths from infectious diseases: Diphtheria, 3 cases, 1 death; scarlet fever, 2 cases, no deaths; typhoid fever, 1 case, no death; whooping cough, 40 or 50 cases, no deaths.

What was done to prevent their spread? When a case of any of the above named diseases was reported, the house was quarantined and the best of attention given the case.

BELLAIRE—DR. J. P. WEST, H. O.

Improvements in sewerage. No changes made in present system. An ordinance in preparation for sewerling 5; sewer district comprising about one-fourth of the city. Remainder of city pretty well supplied with sewers.

Nuisances abated. Privies and water closets, 26; ponds of stagnant water, 3; sewer leaks in cellars, 3; sewer leaks in streets, 2; removal of filth and garbage, 125; premises cleaned, 75.

What has been done to control the privy-vault nuisance? Sanitary policeman makes

semi-weekly tours of inspection and watches carefully all privies.

Hog-pens within corporate limits? 6 or 8. Measures have been made so stringent the people are quitting having hogs in city limits.

Slaughter-houses? Six.

What was done to remove or control these? Nothing done to remove. Controlled by frequent inspections.

Dairies and milk supply inspected? No

School-houses inspected? Yes. Inspected semi-annually.

Number of cases and deaths from infectious diseases: Diphtheria, 2 cases, 1 death; typhoid fever, 12 cases, 2 deaths.

What was done to prevent their spread? Compulsory notification. This has been found a great difficulty. The cases of diphtheria were reported; house quarantined. The death from diphtheria was taken charge of by health officer and sanitary policeman and the corpse wrapped in antiseptic sheet and buried ten hours after death.

BELLE CENTER—DR. S. J. POLLOCK, H. O.

Improvements in sewerage. Cleaning up streets and alleys, and laying tile ditch.

Nuisances abated. Cleansing and renovating privies.

What has been done to control the privy-vault nuisance? Compelling them to keep them as clean as possible, and use lime.

Hog-pens within corporate limits? 20.

Slaughter-houses? None in the corporation, 2 outside limits.

What was done to remove or control these? Keep them clean.

Dairies and milk supply inspected? No. One man supplies milk from the country.

School houses inspected? No. The board of directors and teachers look after them.

BELLEFONTAINE—DR. C. W. HEFFNER, Sec.

Improvements in sewerage. We virtually have no sewerage, save that of natural surface drainage.

Nuisances abated. Old privy-vaults, dam'd water-course under buildings, removal of water holes and mud holes, ash piles, hog-pens, manure piles, and various other improvements, such as cleaning slaughter-houses, etc.

What has been done to control the privy-vault nuisance? An order has been made to have all privy-vaults cemented, and made absolutely water tight, and kept so.

Hog-pens within corporate limits? Possibly 20.

Slaughter houses? Three, I think.

What was done to remove or control these? Compelled the owners or lessees to keep them clean and free from annoying smells.

Dairies and milk supply inspected? There are no dairies in town; and the milk is furnished by men whose work needs no inspection.

School houses inspected? No.

Number of cases and deaths from infectious diseases: Diphtheria, 5 cases, 2 deaths; Scarlet fever, 3 cases, no deaths; typhoid fever, 6 cases, 2 deaths; measles, 20 cases, no deaths; whooping cough, many cases; 1 death.

What was done to prevent their spread? Diphtheria and scarlet fever houses were placarded and quarantined. The others were let run riot. These numbers are only approximate, and may be way wide of the mark.

BELLEVUE—JOHN EARLS, H. O.

Nuisances abated. The removal of garbage, and the cleaning up of nuisances from yards and hog-pens.

What has been done to control the privy-vault nuisance? They have been notified to clean out or remove to new vault when needed.

Hog-pens within corporate limits? Don't know.

How many slaughter houses? Three.

What was done to remove or control these? They are at the extremities of town, and we have kept watch over them, and have them kept as clean as possible.

Dairies and milk supply inspected? No.

School houses inspected? Yes.

Number of cases and deaths from infectious diseases: Diphtheria, 1 case; no deaths; scarlet fever, 15 cases; no deaths; typhoid fever, 8 cases; 2 deaths.

What was done to prevent their spread? Cards put up on the buildings, and also disinfected when needed.

BEREA—T. G. CARD, H. O.

Improvements in sewerage. Sewer well cleaned, and new sewer to be made covering a large portion of our village.

Nuisances abated. Five nuisances abated; 2 hog-pens, 3 privy vaults.

What has been done to control the privy-vault nuisance? All ordered cleaned or removed.

Hog-pens within corporate limits? I don't know.

Slaughter houses? Not any that I know of.

Dairies and milk supply inspected? No.

School houses inspected? No. We should be glad to, if so ordered.

Number of cases and deaths from infectious diseases: Scarlet fever, 24 cases; 2 deaths; typhoid fever, 1 case; no deaths; measles; cases, 23; deaths, 4.

What was done to prevent their spread? Have recommended disinfecting houses, etc., and have used disinfecting fluids.

BLANCHESTER—DR. J. B. JUDKINS, H. O.

Improvements in sewerage. None, except we had the B. & O. S. W. R. R. to open a ditch from their depot to where they could empty the water that collected on the railroad grounds.

Nuisances abated. We have abated eleven privys of bad odor, and have had the owners to clean them up satisfactorily. One person refused to abate a nuisance and we did it for him.

Hog pens within corporate limits? Not known exactly; may be 20.

Slaughter houses? None within corporate limits.

School-houses inspected? Yes, partially. The school-house has seven rooms all in good shape. I asked for the cubic feet of air for each scholar and Mr. Owen Brown gave me the amount. It

was far below what it should be. This room is No. 6. The other teachers neglected to inform me of the air space per scholar.

Number of cases and deaths from infectious diseases: Scarlet fever, 1; typhoid fever, 2.

What was done to prevent their spread? Scarlet fever notice on the door of the house. I gave the family a pamphlet on same disease from State Board of Health.

BLOOMINGBURG—J. J. PINKERTON, H. O.

Improvements in sewerage. Our sewers are made of 12-inch tile, of which we have 620 rods with catch basins to receive all surface water, making drainage sufficient.

Nuisances abated. All garbage, weeds and grass are kept removed. Our aim is to have every thing removed that will create a nuisance.

What has been done to control the privy-vault nuisance? We use disinfectants, such as lime, copperas and carbolic acid, and remove them when necessary.

Hog pens within corporate limits. About ten, which are removed when a nuisance.

Slaughter houses? None.

School-houses inspected? Yes, it is carefully looked after.

Number of cases and deaths from diseases: Typhoid fever, 2, 1 death; measles, 5; whooping cough, about 15 cases.

What was done to prevent their spread? They were quarantined.

BLOOMVILLE—DR. J. W. HOY, H. O.

Nuisances abated. Forty-four notices were served and, I think, all were responded to—mostly privy-vaults. Few instances of carcasses to be removed, cleaning up of stable-yards and filthy alleys.

What has been done to control the privy-vault nuisance? Ordered to be cleaned at least once a year and advised to use dry earth or plenty of lime.

Hog pens within corporate limits? A good many; do not know the number.

Slaughter houses? None within the corporate limits.

School-houses inspected? Yes; advised change of water supply; a general renovation and improvement in ventilation.

Number of cases and deaths from infectious diseases: Diphtheria, 32 cases, 5 deaths; scarlet fever, 8 cases, no deaths; typhoid fever, 3 cases, 1 death.

What was done to prevent their spread? Families were quarantined as nearly so as could well be done in a small town. No scholars from such families were allowed to go to school until notice was given by Health Officer.

BLUFFTON—DR. J. R. CLARK, H. O.

Improvements in sewerage. There has been but about 70 rods of sewer built during the year, and that small, for draining a small area. The village is very well drained.

Nuisances abated. The nuisance of depositing manure and garbage of all kinds in the streets and alleys has been abated, and property owners compelled to keep privies and hog pens clean as possible.

What has been done to control the privy-vault nuisance? Nothing, only to prevent the building of more. The Board has been frequently urged by the Health Officer to adopt measures to get rid of them all.

Hog pens within corporate limits? Can not tell, but a great many more than there should be.

Slaughter houses? Two, where poultry is slaughtered.

What was done to remove or control these? The owners compelled to provide sewerage to convey all the fluids from the village, and to haul the offal outside the limits of corporation. Dairies and milk supply inspected? No.

School-houses inspected? Our school-house has not the most modern improvements but is clean and well ventilated. The rooms are heated by stoves.

Number of cases and deaths from infectious diseases: Typhoid fever, 7 cases, 2 deaths.

BUCYRUS—DR C. H. NOBLET, H. O.

Improvements in sewerage. We have built about two miles of sewers this year; the town is well drained.

Nuisances abated. About 200, as near as I can tell; privies, hog pens, alleys and garbage.

What has been done to control the privy-vault nuisance? Have them cleaned once a year if they need it, and contents removed outside of the city limits in closed barrels.

Hog pens within corporate limits? About twenty-five.

Slaughter houses? Five.

What was done to remove or control these? I have sanitary police inspect them twice a week.

Dairies and milk supply inspected? We have 4 dairies, have milk inspected once a month; found good.

School-houses inspected? Yes, and found them in good condition.

Number of cases and deaths from infectious diseases: Diphtheria, 10 cases, no deaths; scarlet fever, 15 cases, 2 deaths; typhoid fever, 4 cases, no deaths; measles, 12 cases, no deaths; whooping cough, 30 cases, no deaths.

What was done to prevent their spread? We have all cases reported as soon as they are discovered, and a card is put on the house with the name of disease, and Superintendents of the schools are notified not to let any scholars of that family attend school until I send him notice to return them.

CADIZ—MRS. M. J. LYONS, M. D., H. O.

Nuisances abated. But one nuisance reported to Board of Health, which was referred to town council, viz.: An open drain or gutter conducting sewerage from a large hotel and other buildings, to a point on Spring street where it lies in a stagnant pool. No action taken.

What has been done to control the privy-vault nuisance? No new vaults constructed during the past year.

Hog pens within corporate limits. Number not known; none complained of.

Slaughter houses. Two?

What was done to remove or control these? No complaint, no action taken.

Dairies and milk supply inspected? No dairies within the incorporation. Pure milk School-houses inspected? No.

What was done to prevent the spread of infectious diseases? A placard has been placed on each house where contagious or infectious disease is known to exist. Thorough disinfection, and all excreta recommended to be buried. A disposition on the part of some physicians and families to conceal the existence of contagion.

CAMBRIDGE—DR. E. M. STOTTLENIRE, H. O.

Nuisances abated. The number of nuisances abated I can not give, but a good deal has been done in that direction, such as the drainage of stagnant pools of water, and the removal of privy vaults, etc.

What has been done to control the privy-vault nuisance? Privys have been inspected, and when found in bad sanitary condition were required to be cleaned out, and contents moved outside the corporate limits.

Hog pens within corporate limits? The number I can not give. They have been inspected, and required to be cleaned once a day.

Slaughter houses. Three, which are outside the corporate limits.

What was done to remove or control these? Nothing.

Dairies and milk supply inspected? The dairies have not been inspected.

School-houses inspected. The school-houses have been inspected.

Number of cases and deaths from infectious diseases: Diphtheria, 2 cases, no deaths; scarlet fever, 16 cases, 1 death; measles, 2 cases, no deaths.

What was done to prevent their spread? Quarantine by placard. Persons affected were kept at their own homes, and were not allowed to go out until quarantine was removed. The Superintendent of schools was also notified, and children affected were not permitted to go to school.

CAMDEN—MRS. DR. CANNY,

Nuisances abated. None.

What has been done to control the privy-vault nuisance? Nothing.

Hog pens within corporate limits? Many.

Slaughter houses? None.

What was done to remove or control these? Nothing.

Dairies and milk supply inspected. No.

School-houses inspected? No.

Number of cases and deaths from infectious diseases: Diphtheria, 3 cases, no deaths.

What was done to prevent their spread. Isolation.

CANAL DOVER—EMANUEL AMICK, H. O.

What has been done to control the privy-vault nuisance? We require them to make new privy-vaults.

Hog pens within corporate limits? About 50 pens: pens are kept clean and 100 feet away from dwelling.

Slaughter houses? Five; only one inside of corporate limits.

What was done to remove or control these? They are required to wash houses and, bury offal.

Dairies and milk supply inspected? No; there have been no cases of milk sickness reported.

School-houses inspected? Yes.

Number of cases and deaths from infectious diseases: None.

CANTON—DR. J. F. MARCHAND, H. O.

Improvements in sewerage. Central portion of the city has been seweraged; about 15 miles of sewerage now in all.

Nuisances abated. About 200 privy-vaults cleaned out and a large number of manure piles removed; also ash and garbage piles.

What has been done to control the privy-vault nuisance? Nothing. Since our sewerage system has been adopted no new privy-vaults are allowed to be built in the sewerage district.

Hog pens within corporate limits? None.

Slaughter houses? Six.

What was done to remove or control these?

REGULATIONS OF THE BOARD OF HEALTH PREVENTING NUISANCES.

SECTION 1. Be it resolved by the Board of Health of the city of Canton, Ohio, That no distiller, tanner, soap boiler, brewer, tallow chandler, meat packer, dyer, livery stable keeper, manufacturer, butcher, or other person, shall discharge out of, or permit to flow from his, her or their still house, tannery, oil refinery, brewery, slaughter houses, slaughter pen, manufactory, shop, packing house, soap factory, tallow chandlery, dyeing house, stable, or other place, any foul or nauseous liquids or substances, whatsoever, that may be or are liable to become foul, putrid, nauseous, offensive or dangerous to public health.

SEC. 2. No fat, tallow, lard, or other grease, shall be melted or rendered, except when fresh from the slaughtered animal and taken directly from the places of slaughter in the city, and in a condition free from sourness and taint and all other causes of offense at the time of rendering; and all melting and rendering is to be in steam tight vessels, which shall not blow off during the process of steaming and rendering. The gases and odors therefrom shall be destroyed by combustion, or other means equally effective, and according to the best and most approved means and processes; and every thing preceding, following, and in connection with such melting and rendering, and the premises where the same shall be conducted, must be kept clean and free from all offensive odor, and other cause of detriment to the public health or public comfort.

SEC. 3. No fat, lard, or grease, shall be brought into the city to be rendered or melted, and none is to be rendered or melted that has come from any place outside of the city, except as part of the living or dead animal.

SEC. 4. Every soap boiler, tallow chandler, oil maker, slaughter house owner, or other person rendering or melting lard, tallow, grease, or

other fat, shall not keep the same between the months of March and October, inclusive, for more than twenty-four hours before rendering or melting.

SEC. 5. No person or persons owning or occupying any yard, room, building, stall, or other place, where animals are slaughtered, dressed or kept, alive or dead, shall allow such room, yard, building, stall, or other place, to become nauseous, filthy, or unwholesome, or shall neglect to thoroughly cleanse and purify the same at least once in twenty-four hours, or to use suitable disinfectants once a week, and oftener if necessary, between the months of March and October, inclusive, and shall also keep painted or white-washed thoroughly all wood work, except floors and counters, in any building, room, yard, stall or other premises aforesaid.

SEC. 6. No person or persons shall keep for more than twenty-four hours any uncured hides, except at the place where the same are to be manufactured.

SEC. 7. No owner or occupant, lessee or agent, or other person, having control or charge of any tallow chandler shop, soap factory, tannery, brewery, distillery, hide house, slaughter house, pork or beef packing house, livery stable, barn or other place, shall suffer the same to become foul, nauseous or offensive, or to emit any nauseous or offensive odors.

SEC. 8. No person shall boil, heat, dry, keep, store or manufacture any offal, blood, bones, putrid, sour or offensive fat, tallow or lard, or sludge acid, coppers from sludge acid, or potassic cyanide, or any animal or vegetable matter that would generate noisome, offensive or unwholesome odors or vapors; nor shall the business of bone crushing, bone boiling, bone grinding, bone or shell burning, acid restoring, manufacturing coppers from sludge acid, lime varnish, lamp-black, or potassic cyanide making, gut cleaning, skinning, or making glue from any part of dead animals, distilling liquor or alcohol or sludge acid, or other substance that may generate noxious or offensive odors or gases, heating, drying, storing, shipping or transporting any blood, scrap, fat, grease, or offensive animal or vegetable matter, or manufacturing compost or materials for manure, be allowed or conducted in the city without a written permit from said Board signed by the president thereof.

SEC. 9. No dead, undressed and unslaughtered animals, or any part thereof, shall be kept, rendered or fried out within the limits of the city.

SEC. 10. No person or persons owning or occupying any yard, room, building, stall, or other place where animals are slaughtered, dressed or kept, alive or dead, shall cast, throw or discharge, or permit to be cast, thrown or discharged therefrom into any natural water course any refuse matter.

SEC. 11. Every owner, occupant, lessee, or agent, or other person, having control or charge of any tallow chandler shop, soap factory, tannery, brewery, distillery, hide house, slaughter house or yard, room, building, stall, or other place, where animals are slaughtered, dressed or kept, alive or dead, or pork or beef packing house, livery stable or barn, shall permit the

members of the Board of Health, the Health Officer, the sanitary policemen, or other police officers, to have free access to the same at all hours of the day or night, and to make a free and unrestrained examination of all apparatus or utensils used in the same.

SEC. 12. No cattle, hogs, or sheep, shall be kept at any slaughter house, slaughter pen, or slaughter yard, for a period of more than twenty-four hours.

SEC. 13. It shall be unlawful to feed hogs, or other animals, any animal offal, or intestines, or glands, or organs. All waste matter and offal from slaughtered animals shall be burned or carted out of the city within twenty-four hours after slaughtering.

SEC. 14. Whoever violates any of the provisions of the foregoing rules and regulations, shall be fined in any sum not exceeding fifty dollars.

SEC. 15. These rules and regulations shall take effect and be in force from and after their adoption, and ten days after their first publication.

Adopted September 2, 1890.

JOHN F. BLAKE,
President of the Board.

J. F. MARCHAND, *Clerk.*

Dairies and milk supply inspected? Milk supply has been.

School-houses inspected? No.

Number of cases and deaths from infectious diseases: Diphtheria, 1 case, deaths, 1; scarlet fever, 50 cases, deaths, 1; typhoid fever, cases not reported; deaths, 28; measles, 63 cases, deaths, 7; whooping cough, cases not reported, deaths, 1.

What was done to prevent their spread? In all cases of contagious disease pupils were excluded from school in cases where families were afflicted.

CARDINGTON—GENEVA SMITH, H. O.

Improvements in sewerage. Sewerage much improved, several hundred feet having been laid this year.

Nuisances abated. Two nuisances abated—a slaughter house and hog-pen, besides several minor offenses.

What has been done to control the privy-vault nuisance? Nothing.

Hog-pens within corporate limits? About 25. Slaughter houses? 2.

What was done to remove or control these? One was abated, the other regulated.

Dairies and milk supply inspected? No.

School houses inspected? No.

Number of cases and deaths from infectious diseases: Diphtheria, 17 cases, no deaths; Scarlet fever, 1 case, no death; typhoid fever, 10 cases, no deaths; measles, 3 cases, no deaths; whooping cough, 15 cases, no deaths.

What was done to prevent their spread? Isolation.

CELINA—DR. D. H. RICHARDSON, H. O.

Our board was organized June 28th last, and the work reported below, has been done since that time.

Nuisances abated. Three slaughter houses, 2 heaps of manure, 4 livery stables, a poultry house, 13 privy vaults.

What has been done to control the privy-vault nuisance? Nothing, except to have them cleaned and disinfected.

Hog-pens within corporate limits? Don't know. A great many small pens, with 1 to 3 hogs each.

Slaughter houses? None. We compelled their removal in July last.

What was done to remove or control these? Served notice, and the parties made no special resistances, but moved out.

Dairies and milk supply inspected? Yes. Are in good condition.

School houses inspected? Yes.

Number of cases and deaths from infectious diseases: Typhoid fever, cases, 30, deaths, 1; whooping cough, cases, 1.

What was done to prevent their spread? All places reported by sanitary police or observed by Board of Health to be in bad sanitary condition, were ordered cleaned and disinfected, and orders were pretty generally obeyed without trouble. And in case of typhoid fever, stools were disinfected. In case of whooping cough, house was placarded, and patient kept in.

Special cause of ill health? We have no system of sewerage, only two small sewers with open drops to receive surface drainage, which is much worse than none, as some privies are secretly drained into them, and we have no water-works to flush them, or traps to prevent escape of sewer gas at openings, which are left to receive surface water.

CHAGRIN FALLS—GEORGE FLOURS, H. O.

Nuisances abated. Eight; 3 hog-pens and 5 manure piles.

What has been done to control the privy-vault nuisance? 38 privies cleaned out by order of health officer.

Hog-pens within corporate limits? None.

Slaughter-houses? None.

What was done to remove or control these? Declared a nuisance and abated.

Dairies and milk supply inspected? None in corporate limits.

School-houses inspected? Yes.

Number of cases and deaths from infectious diseases: Diphtheria, 1 case, no death; scarlet fever, 7 cases, 1 death; typhoid fever, 2 cases, no deaths.

What was done to prevent their spread? By placing card on house and notifying school. Whooping cough—two-thirds of the children in town had it as near as I can get at it.

CHICAGO—DR. D. H. YOUNG, H. O.

Improvements in sewerage. None, only surface drains and poor at that. There are only about 1,500 feet of covered sewer in the town.

Nuisances abated. Can not give a clear statement. The worst in the town are the hog pens.

What has been done to control the privy-vault nuisance? Have them cleaned and contents buried, covered with lime and sulphate of iron.

Hog-pens within corporate limits? 25.

Slaughter-houses? One just outside that contaminates a spring from which a great many people use the water.

What was done to remove or control these? The council has not furthered my views in these cases.

Dairies and milk supply inspected? The milk supply is from good farms and isolated cows.

School-houses inspected? Yes, but the heating is not perfect; they use the hot air system.

Number of cases and deaths from infectious diseases: Diphtheria, 8 cases, no deaths; scarlet fever, 13 cases, no deaths; typhoid fever, 11 cases, no deaths.

What was done to prevent their spread?

Notice to neighbors and a careful supervision of the location.

Special cause of ill-health? There is a new railroad being built through the town and the moving of the surface soil and a number of privy-vaults on the grade have caused an epidemic of typho-malarial troubles and the kindred diseases. We have a hard clay soil and when it becomes saturated with the refuse it is the worst in the world to contend with.

If we could get rid of the hog-pens it would be the best.

CINCINNATI—DR. J. W. PRENDERGAST, H. O.

Improvements in sewerage. Ten (10) miles of sewer were laid, half of which was pipe sewer and half brick sewer and varying in size from 12-inch pipe to 18 feet by 20 feet. Six hundred (600) house connections with sewer were made.

Nuisances abated. The number of nuisances abated was 39,705. Under this head are such nuisances as arise from "full and foul vaults," "obstructed catch basins, gutters and drains," "filthy yards, alleys, cellars," etc. This department has no supervision over the cleaning of the streets or the removal of garbage. When complaints of that character of nuisances are made they are referred to the street cleaning department.

What has been done to control the privy-vault nuisance? No privy-vault can be dug where it is possible to make sewer connection. Abandoned vaults must be cleaned to the bottom and filled with earth under the supervision of an officer from this department.

Hog-pens within corporate limits? 69.

Slaughter-houses? 69.

What was done to remove or control these? The department endeavors to remove them as far as possible from the central portion of the city. A city ordinance prohibits the keeping of hogs in pens for fattening purposes. Another ordinance also provides that the place, where the killing is done, shall have a perfectly watertight floor, without joints of any kind, except a water-tight tube making a direct sewer connection.

Dairies and milk supply inspected? The inspection of dairies is under the supervision of an inspector and one assistant who makes a weekly report to the health officer.*

School-houses inspected? Yes. We are not yet prepared to make a report of the result.

Number of cases and deaths from infectious diseases: Diphtheria, 1,402 cases, 379 deaths; scarlet fever, 233 cases, 17 deaths; typhoid fever, 196 deaths; measles, 761 cases, 34 deaths; whooping cough, 333 cases, 59 deaths.

What was done to prevent their spread? Physicians are furnished with blank postal cards for the purpose of reporting the above diseases, and upon receipt of these cards, by this department, a specially detailed officer visits the house where such disease exists, and stops any children in the house from attending school, and also notifies the principal of the school that a contagious disease exists in said house, and no child or children in said house may return to school without written permission from the health department.

CLEVELAND—DR. G. C. ASHMUN, H. O.

Improvements in sewerage. Main sewers with house connections; of the former about twelve miles and of the latter about six thousand.

Nuisances abated, 19,799. Alleys filthy, gutters filthy, catch basins, houses, yards and lots, cisterns, wells, ashes and rubbish, manure, stables, chicken and poultry coops, privies, cess-pools, swill and garbage, pig pens, dead animals, slaughter-houses, soap factories, cattle yards, ponds, sewers stopped and school-buildings.

What has been done to control the privy-vault nuisance? Refusing to permit the construction of new vaults on streets, where there are sewers. Cleaning of all vaults filled to within two feet of surface.

Hog pens within corporate limits? None.

Slaughter-houses? 16. This does not include slaughtering poultry.

What was done to remove or control these? Nothing to remove them, but a daily inspection.

Dairies and milk supply inspected? Milk has been tested, and dairies inspected constantly. The keeping of cows has been regulated as to the distance from any dwelling place, one cow 25 feet away and 25 feet added for every additional cow.

School-houses inspected? Yes, but not systematically and regularly.

Number of cases and deaths from infectious diseases: Diphtheria, 563 cases, 158 deaths; scarlet fever, 631 cases, 31 deaths; typhoid fever, 419 cases, 176 deaths; measles, 1,162 cases, 109 deaths; whooping cough, cases not reported, 49 deaths.

What was done to prevent their spread?

Notification to the health office by physicians is required, followed by placarding of houses infected with diphtheria and scarlet fever. The principals of all public schools are furnished each day with a list of all reported cases. Public funerals are prohibited in case of death, and no private carriage is allowed to be used for transporting the dead body of any case.

Special cause of ill health. The prevalence of typhoid fever has been such as to give rise to

*The analysis of milk, both chemical and microscopical, is made by the department chemist.

the suspicion of sewage contamination of the public water supply. This suspicion has not been verified nor disproven.

CLIFTON—DR. WM. HERBERT BELL, H. O.

Improvements in sewerage. The character of sewerage adopted is the separate system, i. e. separation of storm water from house sewage. We now have seven miles of sewer, the whole residence portion of the village being sewered. Nearly all houses in the thickly settled portion of village have made sewerage connection; about one hundred in all.

Nuisances abated, 31, as follows: To connect with sewer, 11; to clean vault, 16; to remove manure, 2; to remove stagnant water. 2.

What has been done to control the privy-vault nuisance? To insist upon cleaning vaults at least once a year, hoping in that way the advantage of sewer tapping will be seen.

Hog-pens within corporate limits? 2.

Slaughter-houses? None.

What was done to remove or control these? Nothing.

Dairies and milk supply inspected? There are two dairies, and their condition fair.

School-houses inspected? Yes.

Number of cases and deaths from infectious diseases: Scarlet fever, 3 cases, no deaths; measles, 4 cases, no deaths; whooping cough, about 25, though none reported.

What was done to prevent their spread? The superintendent of schools notified, in order to prevent attendance of other members of family. The patient was kept isolated until all fear of contagion passed.

CLYDE—ALEX. HARNDEN, H. O.

Nuisances abated, 93. The character of nuisances removed was: Vaults emptied and disinfected, cellars ordered cleaned, dead animals buried, hog-pens and garbage removed.

What has been done to control the privy-vault nuisance? All privy-vaults are cleaned and inspected once a year or oftener, if necessary, and disinfected.

Hog pens within corporate limits? 29.

Slaughter-houses? 1.

What was done to remove or control these? The only slaughter-house is 40 rods from any dwelling; cleanliness prevails and no complaints have been entered.

Dairies and milk supply inspected? No.

School-houses inspected? Yes.

Number of cases and deaths from infectious diseases: Scarlet fever, 16 cases, no deaths; typhoid fever, 3 cases, 1 death; measles, 95 cases, 1 death; whooping cough, 150 cases, 1 death.

What was done to prevent their spread? In cases of contagious and infectious diseases children were prevented from attending public schools until all danger of spreading disease was removed; they were kept from off the streets and disinfectants used when necessary.

COLUMBIANA—GEO. RONINGER, H. O.

Improvements in sewerage. Two streets have cellar sewers. Improvements in sewerage have been made by using traps in cellar sewers to prevent bad odor from reaching the cellars.

7

ST. B. H.

Nuisances abated. Five particular nuisances abated; ponds have been filled up and drained, privies removed and vaults filled and deodorized, hog pens cleaned, deodorized and kept in good condition; slaughter houses outside limits, cleaned and in good condition; drainage of water.

What has been done to control the privy-vault nuisance? The privies, by order of Board of Health, have all been removed, cleaned and deodorized.

Hog pens within corporate limits? About 50 this year; less than last year.

Slaughter houses? Not any.

Dairies and milk supply inspected? Not any dairies in limits and milk supply not inspected.

School-houses inspected? The school-houses have been inspected.

Number of cases and deaths from infectious diseases: Diphtheria, 3 cases, no deaths; typhoid fever, 24 cases, 1 death.

What was done to prevent their spread? The spread has been prevented by good care from our nurses and physicians, and not allowing any person to enter the sick rooms except the nurses. Sick rooms were well ventilated and kept in good condition.

COLUMBUS—DR. LEE MCBRIAR, H. O.

Improvements in sewerage. Total brick sewers, 14,970 linear feet; total length pipe sewer, 31,305 linear feet; total length of all sewers, 46,275 linear feet.

Nuisances abated. Animals, dead, 733; areas, basements, cellars, 231; ashes, street or alley, 729; ashes and garbage, 3,813; cesspools, 50; gutters, 250; henneries, 291; manure, stables, 2,983; sewers, clogged, 762; slops, 851; vaults, contents removed, 1,186; vaults, disinf. or flushed, 357; water closets, impure, 282; wells and cisterns, 148; yards, 929; miscellaneous, 1,228.

What has been done to control the privy-vault nuisance? We are governed in this work by sections 5 and 6 of an ordinance, No. 4498, for the prevention and removal of nuisances in the City of Columbus, passed August 17, 1857. All privy-vaults must be built with walls and bottom of brick or stone not less than 8 inches thick and when completed must be perfectly water-tight; nor can any privy-vault be constructed on any premises where there is a sewer on any street or alley on which the said premises abut; they must also be so constructed that the contents can not pass into the sewer without a sufficient supply of water passing into the sewer at the same time.

Hog pens within your corporate limits? Twenty-five hog pens.

Slaughter houses? Thirty-one slaughter houses.

What was done to remove or control these? Whenever we received any complaint from any person in the immediate neighborhood of either of the above we have them thoroughly disinfected, and if that does not abate the nuisance we have them removed from the city.

Dairies and milk supply inspected? Dairy inspections, 294. All dairies supplying milk to

this city have been inspected and a sample of all milk tested. Milk inspections, 924.

School-houses inspected! All school-houses within corporate limits have been inspected.

Number of cases and deaths from infectious diseases: Diphtheria, 333, deaths, 60; scarlet fever, 317 cases, deaths, 10; typhoid fever, deaths, 65; measles, deaths, 12; whooping cough, deaths, 2.

What was done to prevent their spread? We have followed the directions of the State Board of Health, as prescribed in their pamphlet, kept the children from school, placarded the houses, removed the diphtheria card after 3 weeks and scarlet fever card after 2 weeks.

CONNEAUT—DR. E. D. MERRIAM, H. O.

Improvements in sewerage. A complete system of sewerage has been voted by the town, but not yet commenced to be put in.

Nuisances abated. Nearly all privy-vaults abated; the keeping of hogs abolished within the borough limits; several carcasses of dead animals removed; rubbish heaps are not seen as before, etc.

What has been done to control the privy-vault nuisance? Privy-vaults are not allowed within the limits of the village unless built and cared for according to law.

Hog pens within corporate limits? I know of only 2 and they are in the out-skirts of the town.

Slaughter houses? None.

Dairies and milk supply inspected? No.

School-houses inspected? Yes; they are in a very fair sanitary condition.

Number of cases and deaths from infectious diseases: Scarlet fever, 7 cases, no deaths; typhoid fever, 14 cases, 1 death; measles, 42 cases, 1 death.

What was done to prevent their spread? Cards indicating the disease were posted upon the houses. Superintendent of schools notified of its location. The children of infected houses not admitted until after all danger has passed.

Special cause of ill-health. Low wet places have existed, but are now much improved by better drainage.

CRESTLINE—DR. G. R. EDWARDS, H. O.

Improvements in sewerage. A thorough system of sewerage is, at this time, being put into operation on the west side of town, and when it is completed we will have a perfect system of sewerage introduced.

Nuisances abated. No attention paid to notices.

What has been done to control the privy-vault nuisance? Nothing of any importance during the last year.

Hog pens within corporate limits? About two hundred and fifty.

Slaughter houses? Two.

What was done to remove or control these? Nothing.

Dairies and milk supply inspected? No.

School-houses inspected? Yes, and find them in first-class shape. The ventilation is not all that could be wished for, but will do.

What was done to prevent the spread of infectious diseases? Cases were quarantined,

houses disinfected, and such other precautions as was necessary in each individual case.

Special cause of ill-health. Hog pens and privy-vaults give us more trouble than all other causes combined for complaint.

CUYAHOGA FALLS—DR. JEROME D. DODGE, H. O.

Improvements in sewerage. No system of sewerage. There are a few underground drains, mostly private. The Cuyahoga river affords excellent natural facilities for drainage, the banks being from ten to eighty feet high in village limits and the land sloping to it from both sides.

Nuisances abated: Privies cleaned by order, 10; hog pens ordered out, 3; dead horse ordered removed, 1; stinking meat and bones removed, 1; phosphate in cars removed, 1; filthy streets, and alleys, 2; drains from cellars opened, 1; drains from houses opened, 1; also several privies ordered by my predecessor of which no record was kept.

What has been done to control the privy-vault nuisance? Regulation passed that all new vaults should be cemented and water tight. Dry earth closets recommended in pamphlets circulated or distributed to each house.

Hog pens within corporate limits? A good many, as very many farms are within corporate limits. None, I think, are particularly obnoxious.

Slaughter-houses? Two, but outside village proper.

What was done to remove or control these? Three hog pens were removed by order.

Dairies and milk supply inspected? No.

School-houses inspected? Yes. They are in good condition.

Number of cases and deaths from infectious diseases: Scarlet fever, 1 case, no death; typhoid fever, 1 case, no death; measles, 21 cases, no deaths; whooping cough, it was epidemic, 3 deaths.

What was done to prevent their spread? Red card placed on house of scarlet fever case, and rest of children in that family kept out of school. Scholars with contagious diseases were kept out of school.

DALTON—JOHN M. FISCUS, Clerk B. H.

No sewers put in.

Nuisances abated. There have been about 40 hog pens renovated. Night soil removed from 50 privies.

What has been done to control the privy-vault nuisance? All foul ones ordered cleaned and movable boxes put in so as to be taken out and cleaned.

Hog pens within corporate limits? 95.

Slaughter-houses? None.

What was done to remove or control these? Hog pens cleaned out by order; if not done by property owners, done at property's expense.

Dairies and milk supply inspected? No.

School-houses inspected? Yes, and find the ventilation in the A and B primary, and C and D primary is very poor and the air is very impure.

Number of cases and deaths from infectious

diseases: Scarlet fever, 4 cases, no deaths; typhoid fever, 10 cases, no deaths.

What [was done] to prevent their spread? Quarantine until persons are well, to prevent spreading of the disease.

DAYTON—DR. J. M. WEAVER, [H. O.]

Improvements in sewerage. No sewerage as yet. Contracts for certain portions of city awarded. Injunction suits pending by citizens. Sewerage probable in near future.

Nuisances abated. Full vaults, 745; vaults, disinfected, 180; full cess pools, 51; filthy cisterns, 11; filthy hog pens, 15; filthy cellars, 59; filthy yards, 62; filthy wells, 16; filthy chicken-houses, 2; filthy slaughter-houses, 1; stagnant ponds of water, 3; manure piles removed, 36; total number abated, 1,181.

What has been done to control the privy-vault nuisance? Passage of an order by Board of Health requiring them to be made water-tight.

Hog pens within corporate limits? 37.

Slaughter-houses? 10.

What was done to remove or control these? Nothing to remove. Controlled by frequent inspections.

Dairies and milk supply inspected? Yes.

School-houses inspected? Yes.

Number of cases and deaths from infectious diseases: Diphtheria, 378 cases, 66 deaths; membranous croup, 19 deaths; scarlet fever, 64 cases, no deaths.

What was done to prevent their spread? Houses placarded, funerals private, houses fumigated, thorough house to house sanitary inspection, cleansing of streets, alleys, cess pools and privy-vaults.

Special cause of ill-health. Open privy-vault system, want of sewerage, dug wells. Am insisting on a thorough system of sewerage.

DEFIANCE—DR. A. BERCHTOLD, [H. O.]

Improvements in sewerage. We have built about two miles of trunk sewers. I do not think there is a city of our size better provided with sewerage. All the main streets have trunk sewers, and also several smaller sewers have been put in for sanitary purposes. All sewers are flooded regularly, in summer months, especially, by water works.

Nuisances abated. Number, 52, not including privy-vaults. Character: Stables, 3; yards, 3; hog pens, 17; cess pools, 3; alleys, 3; manure and filth, 16; ditches, 1; gutters, 5; springs, 1.

What has been done to control the privy-vault nuisance? Our sanitary policeman keeps good watch of privy-vaults. 105 were ordered cleaned the past year and 89 new ones built. All privy-vaults newly built must be of brick and cemented.

Hog pens within corporate limits? Probably 12 on the outskirts where sparsely settled and at least 200 feet from any inhabited dwellings.

Slaughter houses? None.

Dairies and milk supply inspected? No.

School-houses inspected? Yes.

Number of cases and deaths from infectious diseases: Diphtheria, 74 cases, 15 deaths; scarlet

fever, 63 cases, no deaths; typhoid fever, 11 cases, 6 deaths; measles, 14 cases, no deaths; whooping cough, 24 cases, no deaths.

What was done to prevent their spread? All cases must be reported to me under penalty. Patients are isolated and houses marked by flags. Children of same family are kept from school, church and other public gatherings.

DELPHOS—C. P. WASHBURN, [H. O.]

Improvements in sewerage. No real system only for surface drainage, which is very good.

Nuisances abated. About 50—mostly privies and pig-stys.

What has been done to control the privy-vault nuisance? We are trying to have all new ones constructed so that contents may be wholly confined and then removed when cleaned.

Hog pens within corporate limits? Do not know, but probably 100.

Slaughter-houses? None. No slaughter-houses allowed in corporation.

Dairies and milk supply inspected? To some extent.

School houses inspected? They have been.

Number of cases and deaths from infectious diseases: Diphtheria, 2 cases, 1 death; Scarlet fever, 1 case, 1 death; typhoid fever, 8 cases, 3 deaths.

What was done to prevent their spread? A close scrutiny is had of each case, and all the precautions possible.

Special cause of ill health? None now, but a creek that flows through a portion of the town, and arrangements are about perfected to keep it clean and healthy.

DELTA—DR. S. P. BISHOP, [H. O.]

Nuisances abated. 2 or 3 offensive pig pens; 12 offensive privies; 15 accumulations of animal offal in alleys.

What has been done to control the privy-vault nuisance? Dry earth, wood or coal ashes used every day in boxes and vaults.

Hog pens within corporate limits? Perhaps 20.

Slaughter houses? None within corporate limits.

What was done to remove or control these? Notices were served by sanitary police and readily complied with in most cases.

Dairies and milk supply inspected? Yes.

School-houses inspected? Yes.

Number of cases and deaths from infectious diseases: Diphtheria, 2 cases, no deaths; typhoid fever, 4 cases, 1 death; whooping cough, 12 cases, 1 death.

What was done to prevent their spread? Quarantine and disinfecting; isolation.

DENNISON—DR. S. L. MCURDY, [H. O.]

Improvements in sewerage. 5200 feet of main sewer was laid, besides the laterals every 25 feet leading into cellars.

Nuisances abated. A number of hog pens have been ordered out of corporate limits, vaults cleaned when offensive, etc.

What has been done to control the privy-vault nuisance? A number are tapping sewer;

others, where sewer is not, are using earth boxes or cement vaults. It is still a nuisance.

Hog pens within corporate limits? 15 or 20. Slaughter-houses? None.

What was done to remove or control these? Whenever a hog pen becomes a nuisance, it is ordered out of the corporation.

Dairies and milk supply inspected? No.

School-houses inspected? Have a new \$30,000 school building, with Ruttan-Smead system of heating and ventilating.

Number of cases and deaths from infectious diseases: Diphtheria, 5 cases, 1 death; typhoid and malarial fever, 100 cases, 2 deaths; measles, 5 cases, no deaths.

What was done to prevent their spread? Strict quarantine of the infected houses.

DUNKIRK—DR. C. C. McLAUGHLIN, H. O.

Improvements in sewerage. There has been about one mile of sewer built this year. Our sewerage system is better than has ever been heretofore.

Nuisances abated. All have been abated, with exception of slaughtering. Ordered Board of Health to enforce ordinance, which was made by council, to prohibit same within corporate limits.

What has been done to control the privy-vault nuisance? Each year they are cleaned, and contents buried or hauled out of corporation.

Hog pens within corporate limits? Probably 40 or 50.

Slaughter-houses? None.

Dairies and milk supply inspected? No.

School-houses inspected? No.

Number of cases and deaths from infectious diseases: Diphtheria, 2 cases, 2 deaths; scarlet fever, 2 cases, no deaths; measles, 3 cases, no deaths; whooping cough, 4 cases, no deaths.

What was done to prevent their spread? Nothing.

EAST LIVERPOOL—WM. GIBBS, H. O.

Improvements in sewerage. There have been seventy thousand dollars expended in sewerage.

Nuisances abated. From 120 to 150 filthy privies, cellars, houses and yards.

What has been done to control the privy-vault nuisance? Compelling owners to empty and fill up the old one with pure soil and attach to the sewer.

Hog pens within corporate limits? None; don't allow hogs to be kept inside of the corporation.

Slaughter houses? None; forbidden, same as hogs are.

What was done to remove or control these? Board of Health passed a law forbidding them inside of the corporation.

Dairies and milk supply inspected? None inside of corporation.

School-houses inspected? I have, and they are in good sanitary condition.

Number of cases and deaths from infectious diseases: Diphtheria, 15 cases, 3 deaths; scarlet fever, 20 cases, no deaths; typhoid fever, 25 cases, 6 deaths.

What was done to prevent their spread? By quarantine and disinfection, and prohibiting any of the family from going to school or mixing with other families; keeping them strictly isolated.

ELMORE—EDWARD DECKER, *Secretary*.

Improvements in sewerage. Fifty rods of small sewer for surface drainage.

Nuisances abated. Twenty-five, one of which was an extensive hog pen and sheds; others were hog pens, privies, etc., of minor importance.

What has been done to control the privy-vault nuisance? Nothing more than to furnish lime for disinfecting them.

Hog pens within corporate limits? Fifty.

Slaughter houses? None.

Dairies and milk supply inspected? No.

School-houses inspected? Yes.

Number of cases and deaths from infectious diseases: Typhoid fever, 2 cases, 1 death; whooping cough, 8 cases, no deaths.

What was done to prevent their spread? Nothing more than ordinary care of the patient.

ELMWOOD PLACE—DR. C. J. SPENCE, H. O.

Nuisances abated. Five. One heap of cow manure, decomposing house slops, and three stagnant pools of water in streets.

What has been done to control the privy-vault nuisance? An ordinance prohibiting such vaults within fifty feet of a well, and requiring all vaults hereafter built to be made water tight.

Hog pens within corporate limits? Three.

Slaughter houses? None.

What was done to remove or control these? An ordinance requiring that all hog pens be kept in a clean and wholesome condition or removed from the corporation, at the discretion of the Board of Health.

Dairies and milk supply inspected? No.

School-houses inspected? Yes.

Number of cases and deaths from infectious diseases: Scarlet fever, 1 case, no deaths; typhoid fever, 4 cases, no deaths.

What was done to prevent their spread? In typhoid cases cleanliness and special attention to disinfection of stools; only one of the above cases originated in this place. In scarlet fever isolation of patient, ventilation of apartment, and thorough disinfection of apartment after recovery.

Special cause of ill health? I know of but one such instance; that is, in one section of the town malaria has been frequent, probably caused by a large pool of stagnant water occupying about two squares of a street. This filthy pool has been drained and filled up.

COLLINWOOD—F. B. GARRETT, *Clerk*.

Nuisances abated. All privies cleaned three times. Two cellars filled. Several deep privy vaults ordered filled. Slop drains discontinued. Dead dogs removed. Accumulation of manure from horse car shops removed. 1 lot of garbage moved, 1 burying of night soil removed, etc. etc.

What has been done to control the privy vault nuisance? We have continued this year our system of cleaning all places three times a year, by a person under contract to do the work.

Hog pens within corporate limits? If any, very few.

Slaughter houses? One.

What was done to remove or control these? Nothing.

Dairies and milk supply inspected? Not this year.

School houses inspected? No. Our Board of Education attends to them carefully.

Number of cases and deaths from infectious diseases: Diphtheria, 2 cases, 1 death; scarlet fever 13 cases, no deaths; typhoid fever 6 cases, 5 deaths; measles, 93 cases, 1 death; whooping cough, 7 cases, no deaths.

What was done to prevent their spread? Cases reported at once, and cards put upon the houses, stating the contagious disease within.

EAST PALESTINE—DR. A. L. LECHESTER, H. O.

Nuisances abated. Lots drained, 10; rubbish and manure piles removed, 8; privies cleaned and disinfected, 21; hog pens cleaned, 6.

What has been done to control the privy-vault nuisance? The Board of Health causes them to be cleaned, disinfected or filled up, whenever any complaint is made about them.

Hog pens within corporate limits? About 80. They have to be kept in good sanitary condition.

Slaughter houses? None.

Dairies and milk supply inspected? No.

School house inspected? Yes, the school house is well ventilated, but the privy is within 20 feet of school house. Board of Health suggested that lot be purchased and privy moved further from school house.

Number of cases and deaths from infectious diseases: Diphtheria, 33 cases, 14 deaths; scarlet fever, 2 cases, no deaths; typhoid fever, 3 cases, 2 deaths; measles, 1 case, no death.

What was done to prevent their spread? Quarantined all the cases. That was all the Board of Health has power to do under the present village ordinance.

Special cause of ill health? This is a very old town site. The water from several wells has been analyzed and found impure. We have now a complete system of water-works, but few people have the water supplied to their houses at this time.

FAYETTE—DR. E. J. EMERICK, H. O.

Nuisances abated. The Lake Shore stock yards were moved.

What has been done to control the privy-vault nuisance? Not any thing.

Hog pens within corporate limits? About 20. Slaughter houses? One.

What was done to remove or control these? Not any thing. The hog pens are kept clean, and the slaughter house is well out from the main part of town.

Dairies and milk supply inspected? No.

School houses inspected? They are in good shape.

Number of cases and deaths from infectious diseases: Scarlet fever, 6 cases, 1 death; measles 4 cases, no deaths; whooping cough, 10 cases, no deaths.

What was done to prevent their spread? Disinfectants were used, and a card put up at the door.

FELICITY—C. E. HOUGHTON, H. O.

Improvements in sewerage. New culverts and cleaning drains.

Nuisances abated. There have been 50 privies and 23 hog pens cleaned and abated.

What has been done to control the privy-vault nuisance? Nothing, except to order new ones being built, cemented.

Hog pens within corporate limits? About 50.

Slaughter houses? None.

Dairies and milk supply inspected? Yes.

School-houses inspected? Yes.

Number of cases and deaths from infectious diseases: Typhoid fever, 2 cases, no deaths; measles, 79 cases, 2 deaths.

What was done to prevent their spread? Quarantine and vaccination.

FINDLAY—AMOS BEARDSLEY, H. O.

Improvements in sewerage. About 1 mile of pipe and $\frac{1}{2}$ mile brick.

Nuisances abated. Four thousand privy-vaults, cesspools, garbage and manure.

What has been done to control the privy-vault nuisance? Nothing.

Hog pens within corporate limits? Not many; a few in suburbs of the city.

Slaughter houses? Four.

What was done to remove or control these? By resolution of the board they were notified to cease slaughtering within the corporate limits by a certain date. On that day the Probate Judge granted the butchers a temporary injunction which was heard November 10, 1890, and the Board of Health was sustained.

Dairies and milk supply inspected? No.

School-houses inspected? Yes.

Number of cases and deaths from infectious diseases: Diphtheria, 30 cases, no deaths; scarlet fever, 50 cases, no deaths; typhoid fever, 20 cases, no deaths; measles, 200 cases, no deaths.

What was done to prevent their spread? Houses placarded and children kept out of school.

FLUSHING—DR. J. V. WEBSTER, H. O.

The Board of Health has been abandoned.

What has been done to control the privy-vault nuisance? Nothing.

Hog pens within corporate limits? Quite a number.

Slaughter houses? One.

What was done to remove or control these? We had slaughter house removed.

Dairies and milk supply inspected? No.

School-houses inspected? No.

Number of cases and deaths from infectious diseases: Typhoid fever, 10 deaths.

What was done to prevent spread? Nothing.

FOREST—DR. W. N. MUNDY, *Clerk.*

Improvements in sewerage. About 2,500 feet of new sewerage 18 and 15 inches in diameter and much sewerage repaired; can't say how many feet.

Nuisances abated. Drained mill-pond and filled it; converted open ditch into sewer; compelled proprietors of cider mill to bury pumice; had garbage from grocers carted away each week; gave town a thorough cleaning.

What has been done to control the privy-vault nuisance? Nothing, with the exception of having them thoroughly cleaned.

Hog pens within corporate limits? Impossible to say; but great many.

Slaughter houses? None.

Dairies and milk supply inspected? Have no dairies, strictly speaking.

School-houses inspected? Yes, and is in good sanitary condition.

Number of cases and deaths from infectious diseases: Diphtheria, 6 cases; 2 deaths: whooping cough, epidemic, 1 death.

What was done to prevent their spread? Diphtheria patient quarantined in room apart from rest of family. No children belonging to family in which there was a case allowed to go to school, and liberal use of disinfectants. Whooping cough, nothing.

FOSTORIA—J. O. HESS, H. O.

Improvements in sewerage. Ordinance for complete sewerage system passed, commissioners appointed, and progress favorable for work the coming season.

Nuisances abated. No general nuisances abated, but many of minor character.

What has been done to control the privy-vault nuisance? State Board instructions adopted throughout and strictly enforced.

Hog pens within corporate limits? None.

Slaughter houses? None.

What was done to remove or control these? "Fired out."

Dairies and milk supply inspected? Yes.

School-houses inspected? Yes.

Number of cases and deaths from infectious diseases: Diphtheria, 8 cases, 2 deaths; scarlet fever, 5 cases, no deaths; typhoid fever 16 cases, 5 deaths; whooping cough, 4 cases, no deaths.

FRANKLIN—DR. D. A. WILLIAMS, H. O.

Improvements in sewerage. Sewerage of the town is limited. The town is long and narrow, and right on the bank of the Big Miami River.

Nuisances abated. Number is indefinite, and character is what would occur in a town of this size, such as hog pens, vaults cleaned, etc.

What has been done to control the privy-vault nuisance? Cleaning, building of new ones, and free use of disinfectants. Our vaults are very carelessly made, but we have excellent water-works now and that does not matter so much.

Hog pens within corporate limits? About twenty-five.

Slaughter houses? Two.

What was done to remove or control these? Nothing to remove, and are controlled by remov-

ing offal, and careful cleanliness and disinfecting.

Dairies and milk supply inspected? No.

School-houses inspected? No, for no complaints have been made in any way. Our school-houses are in good condition and well ventilated.

Number of cases and deaths from infectious diseases: Diphtheria, about 12 cases, 6 deaths; scarlet fever, about 15 cases, 2 deaths; typhoid fever, about 5 cases, no deaths; measles, about 120 cases, no deaths; whooping cough, a few cases, no deaths.

What was done to prevent their spread? Nothing but isolation of the cases and keeping remainder of children in families out of the school.

Special cause of ill health? There is no special cause here now except the location of the town, being between the canal and the river. Since the water-works have been put in typhoid fever cases have been very few, but malarial fever is as frequent as ever.

The report on the number of diseases above is only approximate, as the physicians here pay no attention whatever in reporting infectious or contagious diseases to the Health Officer. It is the same with reference to deaths and births in the community.

FREMONT—DR. F. S. HILLBISH, H. O.

Improvements in sewerage. Three thousand feet in last year, and surveys for at least one mile additional; part of it to be a trunk sewer to intersect other sewers for the purpose of conveying the sewage below the city and into deep water.

Nuisances abated. Pig pens cleaned, 20; dead animals buried, 8; privy-vaults cleaned, 28; cellars and back yards cleaned, 21; new vaults (water tight), 60; manure and rubbish, 31. Total, 168.

What has been done to control the privy-vault nuisance? As near as possible to the rules adopted a year ago, if an old vault gets to be a nuisance it is removed and a new one ordered (water tight).

Hog pens within corporate limits? First Ward, 11; Second Ward, 21; Third Ward, 52; Fourth Ward, 12. Total, 99.

Slaughter houses? None.

What was done to remove or control these? Nothing as to the abolishment of them, but have had the sanitary policeman watch them closely and prevent them from becoming bad.

Dairies and milk supply inspected? Yes; in good condition.

School-houses inspected? Yes.

Number of cases and deaths from infectious diseases: Diphtheria, 3 cases, no deaths; scarlet fever, 2 cases, no deaths; typhoid fever, 1 case, no deaths.

What was done to prevent their spread? The houses were placarded and disinfected, while the inmates were quarantined. There were no new cases from infection. In each instance where it developed it was brought to town either by person or in clothing, with the exception of the typhoid case which developed here.

Special cause of ill health? There is none with the possible exception of one or two streets that ought to have better surface drainage. We were somewhat alarmed during the month of October by quantities of dead fish being found between this place and Tiffin, that were supposed to be killed either by a straw board factory or some poisonous substance from a brewery near Tiffin. The danger to us from any dead or decaying animal matter is the contamination of our water supply, which, while we do not take it directly from the river, our reservoir is quite close.

FREDERICKSBURG—L. C. MILLER, H. O.

Nuisances abated. Five privy-vaults.

What has been done to control the privy-vault nuisance? Ordered closed up.

Hog pens within corporate limits? Ten.

Slaughter-houses? One.

What was done to remove or control these? Ordered cleaned.

Dairies and milk supply inspected? No.

School-houses inspected? Yes.

GALION—DR. WEBB J. KELLY, H. O.

Improvements in sewerage. Putting in 12,000 feet of sewer. Part of it completed.

Nuisances abated. A great many minor nuisances.

What has been done to control the privy-vault nuisance? Empty on odorless plan.

Hog pens within corporate limits? A great many have endeavored to get council to pass ordinance prohibiting them.

Slaughter-houses? One at extreme limits.

Dairies and milk supply inspected? Some.

School-houses inspected? Yes.

GALLIPOLIS—DR. E. WESTLAKE, H. O.

Improvements in sewerage. No sewerage, all surface drainage.

Nuisances abated. Fifteen: five hog pens and ten privy-vaults.

What has been done to control the privy-vault nuisance? When the vault becomes full the owner is compelled to dig a new one.

Hog pens within corporate limits? Not less than one hundred.

Slaughter-houses? Three.

What was done to remove or control these? The offal is removed every day out of the city limits.

Dairies and milk supply inspected? No.

School-houses inspected? No.

Number of cases and deaths from infectious diseases: Typhoid fever, number cases unknown, 3 deaths.

What was done to prevent their spread? Isolation.

GARRETTSVILLE—DR. LUTHER LEE JOHNSON, H. O.

Improvements in sewerage. None.

Nuisances abated. Two, clean privy and bury dead carcass.

What has been done to control the privy-vault nuisance? Nothing.

Hog pens within corporate limits? Thirty-eight.

Slaughter-houses? Two.

What was done to remove or control these? Council passed an ordinance to prevent the keeping of a hog within 150 feet of any dwelling, and at its next meeting reconsidered it.

Dairies and milk supply inspected? No.

School-houses inspected? Yes.

Number of cases and deaths from infectious diseases: Measles, 35 cases, no deaths.

What was done to prevent their spread? Kept children out of school and at home.

Special cause of ill-health. The filthy streets have been cleaned in a novel way, i. e., getting the fire company out and washing the filth off the streets with the water.

GAMBIER—DR. JOE WAGNER, H. O.

What has been done to control the privy-vault nuisance? An inspector was sent to inspect each vault in town and his directions have been carried into effect in part only.

Hog pens within corporate limits? Do not know the number.

Slaughter-houses? One.

What was done to remove or control these? Nothing.

Dairies and milk supply inspected? We have no dairies.

School-houses inspected? No.

Number of cases and deaths from infectious diseases. None in the village since my term began that I have seen.

Special cause of ill-health. We had a pond of standing water, but have had it drained.

GENEVA—DR. GEO. W. FOSTER, H. O.

Improvements in sewerage. One mile of sewerage, from 5 to 16 inches.

Nuisances abated. Privies inspected and acted upon, 254; private drains, 14; cellars, 11; dead horses, dogs and cats in streets, 9; ashes in street, 10; hog pens abated, 10; wells, 2; manure piles, 3.

What has been done to control the privy-vault nuisance? Nearly all having bad nuisances have obeyed the code and placed a galvanized iron pan under the seat.

Hog pens within corporate limits? Four.

Slaughter-houses? Three.

What was done to remove or control these? Been thoroughly inspected, and are now in a No. 1, first class condition—frequent inspections made.

Dairies and milk supply inspected? Thoroughly, and milk analyzed.

School-houses inspected? Yes, and are in extra condition, disinfected often and sewerage overhauled and cleaned.

Number of cases and deaths from infectious diseases: Diphtheria, 14 cases, 5 deaths; scarlet fever, 8 cases, 1 death; typhoid fever, 6 cases, 1 death; measles, 2 cases, no death.

What was done to prevent their spread? Every contagious disease has been placarded—and rules followed to the letter, preventing any spread, whatever.

Special cause of ill-health. No special disease.

The Board has done thorough work, and the people have entered in accordance with its rules.

GLENVILLE—CHAS. B. COOK, H. O.

Improvements in sewerage. We have no sewers for house drainage, only for street drainage.

Nuisances abated. 87; cleaning of privies, barn-yards, draining stagnant ponds of water, removing manure piles and cleaning hog pens. We compel gardeners to plow refuse cabbage under after the crop is removed.

What has been done to control the privy-vault nuisance? We have taken no steps to remove, but recommend the earth closets here in this place.

Hog pens within corporate limits? 19.

Slaughter-houses? We have none in the corporation.

Dairies and milk supply inspected? Yes, we have had milk of the principal peddlers inspected.

School-houses inspected? Yes.

Number of cases and deaths from infectious diseases: Diphtheria, 9 cases, no deaths; scarlet fever, 34 cases, no deaths; typhoid fever, 7 cases, no deaths; measles, 21 cases, 1 death; whooping cough, 17 cases, 2 deaths.

What was done to prevent their spread? Where a disease is known to be contagious, we placard the house where same exists, and do not allow children in such cases to attend school, until their physician certifies as to their convalescence.

GLOUSTER—DR. D. W. COLLISON, H. O.

Nuisances abated. One water-closet.

What has been done to control the privy-vault nuisance? Nothing more than to have them of a depth of 6 feet.

Hog pens within corporate limits? Quite a number.

Slaughter-houses? Two.

What was done to remove or control these? Made an order to have them removed; two of our citizens have entered suit for damages and same will be tried at next term of court.

Dairies and milk supply inspected? Have none.

School houses inspected? No.

Number of cases and deaths from infectious diseases: Typhoid fever, 1 case, 1 death.

What was done to prevent their spread? Nothing more than disinfectant, etc.

HAMILTON—DR. GEORGE TREBEL, H. O.

Improvements in sewerage. We have no sewers, but plans are now being considered for the sewerage of the entire city.

Nuisances abated. 1,216; mainly composed of full vaults, hog pens, garbage on premises and manure in alleys.

What has been done to control the privy-vault nuisance? Vault cleaners are compelled to find their own land for the burial of night soil.

Hog pens within corporate limits? None to my knowledge.

Slaughter-houses? Three.

What was done to remove or control these? Have forced them to build private sewers, and drain to the river.

Dairies and milk supply inspected? Have no meat and milk inspector at present.

School-houses inspected? Yes, they are in excellent sanitary condition, as to ventilation.

Number of cases and deaths from infectious diseases: Diphtheria, 21 cases, 10 deaths; scarlet fever, 5 cases, no deaths; typhoid fever, 4 cases, 2 deaths.

What was done to prevent their spread? In scarlet fever and diphtheria the houses are placarded and strictly quarantined; members of the family are not permitted to attend school. After termination of a case, the house is fumigated with sulphur.

HICKSVILLE—S. BLODGET, H. O.

Nuisances abated. Forty privy vaults, cess-pools, and ponds.

What has been done to control the privy vault nuisance? We are having them filled up.

Hog pens within corporate limits? About 40.

Slaughter houses? None.

Dairies and milk supply inspected? No.

School houses inspected? Yes, three rooms. There is no ventilation except by the windows, and poor heating arrangements in two of those rooms; there are from 60 to 70 children. Size of rooms about 16 by 30.

Special cause of ill health? None, only our school house and our wells. We proposed a system of ventilation for our school house to the school board. They have let the job of putting it in, but it is not yet done. As to our wells, we will soon have a system of water-works that will give us fresh fountain water.

HIGGINSPOUT—PHILIP J. DANUM, H. O.

Improvements in sewerage. No improvements.

Nuisances abated. One back yard cleaned, two cellars emptied of standing water, and a few small nuisances on street and alleys cleared away.

What has been done to control the privy vault nuisance? Nothing.

Hog pens within corporate limits? Do not know, perhaps a dozen.

Slaughter houses? None.

Dairies and milk supply inspected? No. Our dairy is all right.

School houses inspected? No.

Number of cases and deaths from infectious diseases: Diphtheria, 6 cases, 2 deaths; typhoid fever, 4 cases, 1 death; whooping cough, 1 death.

HILLIARDS—DR. N. P. DAVIDSON, H. O.

Nuisances abated. About ten privy vaults were condemned and renovated. Two or three hog pens were condemned, abandoned and renovated.

What has been done to control the privy vault nuisance? All privy vaults were ordered to be either renovated or thoroughly disinfected

Hog pens within corporate limits? Not more than four at the present time.

Slaughter houses? None.

Dairies and milk supply inspected? No, we have no dairies here.

School houses inspected? Yes, and while find it in fair condition, yet it was thoroughly disinfected.

Number of cases and deaths from infectious diseases: Diphtheria, 5 cases, no deaths; scarlet fever 15 cases, 2 deaths; typhoid fever, 6 cases, 1 death; whooping cough, 7 cases, no deaths.

What was done to prevent their spread? The sign, "scarlet fever," was placed on the door of all houses containing one or more cases. Strict isolation and disinfection were ordered. This was done in diphtheria also. No special precautions were taken in the other named diseases.

IRONTON—DR. N. K. Moxley, Jr., H. O.

Nuisances abated. Two hundred.

What has been done to control the privy vault nuisance? 75 new ones dug; 25 old ones shot with dynamite.

Hog pens within corporate limits? About 125.

Slaughter houses? Five.

What was done to remove or control these? Sanitary officer has had them kept clean, and insisted on frequent use of lime and other disinfectants.

Dairies and milk supply inspected? Yes.

School houses inspected? Yes.

Number of cases and deaths from infectious diseases: Diphtheria, 13 cases, 3 deaths; scarlet fever, 30 cases, 2 deaths; typhoid fever, 8 deaths; measles, 48 cases, 3 deaths; whooping cough, 2 cases, 1 death.

What was done to prevent their spread? Houses were placarded and physicians required to report their cases. Superintendent of public schools is notified to refuse admittance to scholars coming from houses where such diseases exist. Funerals of persons dying of such diseases are not to be held in a church.

Special cause of ill health? There is none except perhaps a creek running through our city. This has been the subject of much discussion by our local board, and in the near future we hope to have it converted into a sewer, but as yet nothing definite has been done.

JACKSON—B. F. HOLCOMB, H. O.

Nuisances abated. None.

What has been done to control the privy-vault nuisance? Nothing.

Hog pens within corporate limits? Do not know; a great many.

Slaughter-houses? None.

What was done to remove or control these? Nothing.

Dairies and milk supply inspected? No.

School-houses inspected? No.

Number of cases and deaths from infectious diseases: Diphtheria, 5 cases, 1 death; scarlet fever, 14 cases, 2 deaths; typhoid fever, 23 cases, no deaths; measles, 2 cases, no deaths.

JAMESTOWN—DR. F. W. OGAN, H. O.

Improvements in sewerage. Two sewers about 30-in. in diameter. These are tapped by private sewers made from common tiling.

Nuisances abated. Twelve, consisting of hog pens, cesspools and privy-vaults.

What has been done to control the privy-vault nuisance? Cleaning and disinfecting controlled by village ordinance.

Slaughter-houses within corporation? None.

Dairies and milk supply inspected? No.

School-houses inspected? Yes.

Number of cases and deaths from infectious diseases: Diphtheria, 8 cases, 2 deaths; typhoid fever, 4 cases, no deaths.

What was done to prevent their spread? Isolation and disinfection.

LANCASTER—DR. J. W. LEWIS, H. O.

Improvements in sewerage. None.

Nuisances abated. Thirty-five hog pens, 15 privy-vaults, 20 slush washes in streets and alleys.

What has been done to control the privy-vault nuisance? Nothing.

Hog-pens within corporate limits? About 150.

Slaughter-houses? Ten.

What was done to remove or control these? Notice to cleanse and abate stench.

Dairies and milk supply inspected? No.

School-houses inspected? Yes, once; in good condition.

Number of cases and deaths from infectious diseases: Diphtheria, 134 cases, 23 deaths; scarlet fever, 17 cases, 2 deaths.

What was done to prevent their spread? Card on houses and sulphur disinfection.

Special cause of ill health. A filthy sewer and nothing done by the council to abate or improve the same.

LEBANON—DR. J. B. GRAHAM, Clerk.

Improvements in sewerage. No improvements in the line of sewers; the town is situated on descending ground, easily kept clean.

Nuisances abated. Half dozen manure piles and a number of foul vaults abated.

What has been done to control the privy-vault nuisance? Nothing but close supervision. A resolution pending to compel cemented vaults to be constructed.

Hog pens within corporate limits? But few; can't give the number, probably half dozen.

Slaughter houses? All outside corporate limits but one.

What was done to remove or control these? Supervision causes it to be kept clean.

Dairies and milk supply inspected. No inspection; no dairies.

School-houses inspected? One large union school building; kept in prime condition.

Number of cases and deaths from infectious diseases: Typhoid fever, 30 cases, 1 death.

I think there were more deaths, but these are all that were reported by the physicians.

Special cause of ill-health. The only cause known is very bad water in dry seasons, well water being highly charged with sulphureted

hydrogen. The only thing done in that line was to vote down a proposition for a plentiful supply of pure water.

LEESBURG—DR. H. A. BEESON, H. O.

Improvements in sewerage. A considerable amount of improvement in the way of conduit, and some large sewer tile taking the place of small covered ditches.

Nuisances abated. None.

What has been done to control the privy-vault nuisance? Nothing.

Hog pens within corporate limits? Two or three.

Slaughter-houses? One.

What was done to remove or control these? Required to be kept thoroughly clean and occasionally disinfected.

Dairies and milk supply inspected? Have no dairies coming within the meaning of the term.

School-houses inspected? No; no report has been received, and a voluntary inspection would be resented as meddlesome.

Number of cases and deaths from infectious diseases: Diphtheria, 15 cases, 1 death; typhoid fever, 5 cases, 1 death.

What was done to prevent their spread? In the cases I had charge of care was diligently employed in a general system of disinfection. I can not answer for others, for reasons of the present town administration not being friendly to health boards.

Special cause of ill health. The present town authorities are not inclined to take advanced steps in hygienic affairs. I can not, therefore, assume any responsibility. We have an alleged Board of Health, but they take no interest in the matter. An epidemic of some kind would be an advantage to us. I don't really know that I am the Health Officer, but as there is no other, I am willing to keep up the fiction in the hope of a better state of affairs.

LEETONIA—DR. S. R. MCCREADY, H. O.

Nuisances abated. Twenty-five or 30 privy-vaults, manure heaps, hog pens, cesspools, etc.

What has been done to control the privy-vault nuisance? Many things. Whenever we find a vault in bad condition we have it cleaned. Sanitary policeman examines vaults every month.

Hog pens within corporate limits? About 25.

Slaughter-houses? One only.

What was done to remove or control these? Parties warned to dray off waste and keep things clean.

Dairies and milk supply inspected? No.

School-houses inspected? Yes.

Number of cases and deaths from infectious diseases: My term of office began the 1st of April, 1890. We have done many things in the way of abating nuisances, and have had no diphtheria, scarlet fever or typhoid fever since.

LEIPSIC—Member Board of Health.

Nuisances abated. A few privy-vaults cleaned.

What has been done to control the privy-vault nuisance? Have adopted a rule requiring

removal of the contents and construction of water-tight vaults.

Hog pens within corporate limits? I would estimate the number at 250.

Slaughter houses? One.

What was done to remove or control these? Have a village ordinance regulating the operation which is not enforced; have declared one a nuisance and ordered its removal; order not executed.

Dairies and milk supply inspected? No.

School-houses inspected? Yes.

Number of cases and deaths from infectious diseases: Typhoid fever, 12 cases, 1 death.

What was done to prevent their spread? No occasion to use preventives as there have been no cases.

Special cause of ill-health. A badly kept slaughter house and typhoid fever prevailing in its vicinity.

LIMA—DR. J. J. MURPHY, H. O.

Improvement in sewerage. A number of miles of extension has been made. The sewer fund being exhausted, more could not be put down.

Nuisances abated. Am unable to state the number. Two sanitary policemen patrol the city the year around, and find plenty to do in abating nuisances—house to house inspectors and other matters coming under their jurisdiction.

What has been done to control the privy-vault nuisance? The brick and cemented vault is recommended here, but is not obligatory. The soil is non porous. Injury resulting from them must be rare. I have been unable to detect any case of sickness which we could attribute to them in a practice of nine years here. People are compelled to keep their closets from becoming offensive, and clean them out yearly, as far as possible, or make new vaults.

Hog pens within corporate limits? I am unable to state the number.

Slaughter-houses? About four.

What was done to remove or control these? No action has been taken by the Board to remove them. They are located in out-of-the-way places, and in the heated term we send then written and verbal notices regularly, and compel them to be kept as clean as possible. We receive little complaint from the people in regard, to them.

Dairies and milk supply inspected? Partially.

School-houses inspected? Not all. Those we have are in good condition, as regards sanitation and danger from fire, and we have reason to believe they all are.

Number of cases and deaths from infectious diseases: Diphtheria, 52 cases, 13 deaths; scarlet fever, 25 cases, 1 death; typhoid fever, 1 case, no death; measles, 5 cases, no deaths; whooping cough, 3 cases, no deaths.

What was done to prevent their spread? Typhoid fever, not prevalent, though no doubt more cases existed as they are not placarded, perhaps were not reported. Whooping cough also prevailed epidemically, and I personally knew of several deaths. Isolation and disinfection.

tion were the means used in preventing their spread. Also placarding.

Special cause of ill health. We believe the most serious nuisance, the one that is the most monstrous, the most offensive, is Hog creek, or Ottawa river, which flows through the center of the city, and which is contaminated by the Lima paper mill and Lima brewery. The Board of Health has repeatedly waxed warm and loud against this nuisance, fought it in the courts, and were finally beaten, so that of late the public have stood it as a matter of course. As these are important industries here, some members of the Board object to further agitation, as it might result in the loss of the paper mill, an important industry.

We have recommended the Board to enforce burial permits, without avail; also, school vaccination. We believe diphtheria cases should be quarantined like small-pox.

LINWOOD—E. W. WILKINSON, H. O.

Nuisances abated. Two vaults cleaned and repaired.

Hog-pens within corporate limits? Two.

Slaughter-houses? None.

Dairies and milk supply inspected? No.

School-houses inspected? Being superintendent of schools, I have done so frequently.

Number of cases and deaths from infectious diseases: Diphtheria, 4 cases, no deaths; measles, 28 cases, no deaths; whooping cough, 2 cases, 1 death.

What was done to prevent their spread? Prompt attention to quarantining houses, suspension of members of families so afflicted from schools promptly.

LA RUE—J. A. MOUSER, H. O.

Improvements in sewers. Sewer tile in a large part of the village. Drainage to the Scioto river. New school-house being erected, and a fine sewer being put in to the Scioto river.

Nuisances abated. One or two.

What has been done to control the privy vault nuisance? Notice has been served on one man, and the nuisance abated. Vaults generally dug, and bad, but not considered a positive nuisance.

Hog pens within corporate limits? About seventy-five.

Slaughter-houses? None.

What was done to remove or control these? Nothing.

Dairies and milk supply inspected? No.

School houses inspected? Yes, often.

Number of cases and deaths from infectious diseases: Typhoid fever, 1 case, 1 death.

What was done to prevent its spread? Nothing, except fixing the well which caused typhoid fever by admitting surface water

LOCKLAND—R. B. LATTA, H. O.

Nuisances abated. I can not particularize, but several places of standing water along rail road have been abated by draining. Also some ponds on the flat lands have been filled up with dirt.

What has been done to control the privy-

vault nuisance? We have had sixteen vaults cleaned and ten new vaults dug. The old vaults filled three feet below the surface.

Hog pens within corporate limits? Ten or twelve with from one to three hogs in each. They are kept clean.

Slaughter-houses? None.

Dairies and milk supply been inspected? They have, and all found in fairly good condition.

School-houses inspected? I have, and found them models of cleanliness.

Number of cases and deaths from infectious diseases: Diphtheria, 6 cases, 2 deaths; scarlet fever, 10 cases, no deaths; whooping cough, 2 cases, no deaths.

What was done to prevent their spread? On receiving notice, have at once placed warning cards on the house, and given orders that there should be no unnecessary going out of the family. Have notified the superintendent of the schools.

LOGAN—DR. I. C. WRIGHT, H. O.

Nuisances abated. The Board, through its sanitary policeman has abated, or caused to be abated, the following nuisances: Twenty hog pens, 3 privy-vaults, and buried 1 dead dog; also cleaned out mud and fifth in 12 alleys and filled up with gravel, and cleaned out weeds, brush, filth, etc., in two small streams running through town, besides cutting weeds in streets.

What has been done to control the privy-vault nuisance? No active measures have ever yet been employed, except to abate filthy or overflowing vaults.

Hog pens within corporate limits? One hundred and sixty-one.

Slaughter-houses? Two.

What was done to remove or control these? No complaint has ever been made against either slaughter-house, therefore no action was necessary. Both are well out of town.

Dairies and milk supply inspected? No.

School-houses inspected? Yes, and the same was condemned in certain regards as unsuitable for school purposes, but that will be remedied by the erection of a fine new school-house.

Number of cases and deaths from infectious diseases: Diphtheria, 1 case, no deaths; scarlet fever, 1 case, no deaths; measles, 2 cases, no deaths; whooping cough, epidemic, 2 deaths.

What was done to prevent their spread? Scholars from the afflicted families excluded from the public schools, separation of the well from the sick as much as possible, along with other proper precautions and sanitary measures.

LONDON—DR. M. M. MOFFITT, *Member Board of Health.*

Improvements in sewerage. Have taken up one large sewer that was filled up and caused stench for years. Replaced with a larger size.

Nuisances abated. Preventing privy-vaults from being emptied into large sewer.

What has been done to control the privy-vault nuisance? The Health Officer has taken name and number of entire city vaults. Has

visited premises of the same, saw that they were in good condition.

Hog pens within corporate limits? None from May 1st to Oct. 1st each year.

Slaughter-houses? None.

What was done to remove or control these? The Board of Health caused their removal to outside city limits.

Dairies and milk supply inspected? Only one, and that inspected by sanitary officer of Columbus.

School-houses inspected? No.

Number of cases and deaths from infectious diseases: Scarlet fever, 1 case, no death; typhoid fever, 15 cases, 1 death; measles, 35 cases, no deaths.

What was done to prevent their spread? The usual medical attention and the isolation of the cases.

LORAIN—DR. S. S. COX, II. O.

What has been done to control the privy-vault nuisance? Parties wishing to change or construct new ones must have a permit.

Hog pens within corporate limits? None.

Slaughter houses? None.

What was done to remove or control these? No hog pen is allowed in the corporation without a written permit from the mayor, and such permit can only be issued on proof that the pen is 200 feet from any dwelling.

Dairies and milk supply inspected? No.

School-houses inspected? Yes.

Number of cases and deaths from infectious diseases: Scarlet fever, 3 death; typhoid fever, 3 deaths; whooping cough, 2 deaths.

What was done to prevent their spread? Pupils from houses infected excluded from schools, and all excluded from public gatherings.

Special cause of ill health? Large marsh and defective sewerage.

McCOMB—DR. JNO. A. THOMPSON, H. O.

Improvements in sewerage. Nothing accomplished this year. Extensive improvement in storm-water drainage in contemplation.

Nuisances abated. Twelve or fourteen privy-vaults cleaned, and manure heaps in alleys looked after.

Hog pens within corporate limits? Probably fifty.

Slaughter houses? One.

What was done to remove or control these? Nothing.

Dairies and milk supply inspected? No.

School-houses inspected? Yes.

Number of cases and deaths from infectious diseases: Diphtheria, 5 cases, 2 deaths; typhoid fever 1 case, no deaths.

What was done to prevent their spread? Cases of diphtheria were carefully looked after, and recommendations of State Board strictly carried out.

Special cause of ill health? Very bad drainage of three-fifths of town. Nothing done this season.

MADISON—DR. A. H. STOCKHAM, H. O.

Improvements in sewerage. One small sewer, 15 rods long; 6-inch pipe, to drain sink-hole.

Nuisances abated. None of importance; our village is clean, and there has been but little need in this line.

What has been done to control the privy-vault nuisance? Nothing has been deemed necessary.

Hog pens within corporate limits? Probably from 25 to 50.

Slaughter houses? One.

What was done to remove or control these? Ordered kept in good condition, to which the owners complied.

Dairies and milk supply inspected? No.

School-houses inspected? Yes.

Number of cases and deaths from infectious diseases: Diphtheria, 12 cases, 2 deaths; scarlet fever, 15 cases, no deaths; typhoid fever, 4 cases, no deaths; measles, 25 cases, no deaths; whooping cough, 20 cases, no deaths.

I have estimated the number.

What was done to prevent their spread? Scholars not allowed to attend school, and in most cases restricted from being on the streets.

MADISONVILLE—DR. C. P. GRAY, H. O.

Nuisances abated. Privy vaults, pig pens, manure pits, garbage dumps, etc.

What has been done to control the privy-vault nuisance? Compulsory construction of new ones and disinfection of old ones, under the requirement.

Hog pens within corporate limits? A great many, and a nuisance; have to constantly order cleansing.

Slaughter houses? By ordinance of council none allowed within 300 feet of any dwelling house. Have none now.

What was done to remove or control these? Previous to the passage of this ordinance I had great difficulty in proving same a nuisance, even as carelessly as it was conducted.

Dairies and milk supply inspected? No.

School-houses inspected? Not this year.

Number of cases and deaths from infectious diseases: Diphtheria, 5 cases, 1 death; scarlet fever, 2 cases, 1 death; typhoid fever, 5 cases, 2 deaths; measles, 4 cases, no deaths; whooping cough, 4 cases, no deaths.

What was done to prevent their spread? Places were quarantined, excrements disinfected, etc.

Special cause of ill health? Garbage is a threatening evil, as our town increases; even now a source of annoyance.

MANSFIELD—DR. R. HARVEY REED, H. O.

Improvements in sewerage. None.

Nuisances abated. 872; character is legion, from dead cats up to dead horses and from foul cellars and filthy privies down to filthy alleys, streets, yards and slop barrels.

What has been done to control the privy-vault nuisance? Have cleaned 137 privy-vaults

Advise dry closets or sewer connections and the abandoning of the old fashioned vaults.

Hog pens within corporate limits? About 200; are trying to get them all eliminated.

Slaughter-houses? Two.

What was done to remove or control these? They have all been inspected and a movement is on foot to establish an abattoir, and abandon the slaughter-houses entirely.

Dairies and milk supply inspected? No.

School-houses inspected? Yes.

Number of cases and deaths from infectious diseases: (Since January 1, 1890.) Diphtheria, 32 cases, 4 deaths; scarlet fever, 6 cases, 4 deaths; typhoid fever, 7 cases, 1 death; measles, 1 case, no death; whooping cough, 1 case, 1 death.

What was done to prevent their spread? Placarded and quarantined them.

MARIETTA—Dr. C. W. EDDY, *Secretary*.

Improvements in sewerage. Part of our open drains have been bricked.

Nuisances abated. We have had but few complaints this year and those mostly pig pens and privy-vaults.

What has been done to control the privy-vault nuisance? Nothing.

Hog pens within corporate limits? Can not say. Will have them counted the coming year.

Slaughter-houses? The city ordinance prohibits them within corporate limits.

Dairies and milk supply inspected? No, we have no milk inspector yet.

School-houses inspected? No.

Number of cases and deaths from infectious diseases: Typhoid fever, 5 cases, 3 deaths.

What was done to prevent their spread? Our city is built over considerable ground and our people understand very well how to deport themselves. When any contagious disease breaks out in a family the children (if any) are not allowed to attend school.

MASSILLON—Dr. T. CLARKE MILLER, H. O.

Improvements in sewerage. About three miles of main sewer, 20 to 24 inches, were put in during the last year. An ordinance regulating house plumbing and sewer connections, recommended by Board of Health and passed council.

Nuisances abated. Hog pens, 27; privy vaults, 63; dead animals, 21; dangerous cellars, 49; miscellaneous, 85.

What has been done to control the privy-vault nuisance?

AN ORDINANCE PROVIDING FOR THE MAKING AND CARE OF PRIVY-VAULTS AND REMOVAL OF NIGHT SOIL IN THE CITY OF MASSILLON.

SECTION 1. *Be it ordained by the Council of the City of Massillon, That every building in the limits of the city shall be provided with water closets, privies or privy-vaults of sufficient size and sufficient in number to accommodate all persons who work in or inhabit such buildings, or use such water-closets, privies or privy-vaults, and the owner, agent, lessee, occupant or other person having control of the premises on which such water closet, privy or privy-vault is situated*

shall keep the same water-closet, privy or privy-vault in good condition and constant repair.

SEC. 2. Any person or persons intending to construct a privy-vault or cess-pool shall first obtain a written permit so to do from the Board of Health, signed by the health officer, which permit shall designate the location on lot, distance from any house, well or spring, whether to be made water-tight or otherwise, the depth thereof, and shall state that ventilation is required. Said permit shall state that the owner, occupant, agent or person in charge shall submit to all requirements thereafter made by the Board of Health or the health officer intended to keep said vault in good condition. Any person or persons violating said permit or constructing any such vault or cesspool without obtaining the same, or disregarding the rules, orders or regulations of the Board of Health shall be subject to the penalties presented in this ordinance.

SEC. 3. No privy-vault, privy or water-closet, or other receptable or place used for the deposit of night soil or other waste, shall be allowed by the owner, lessee, agent, tenant, occupant, or other person having charge of the premises upon which such privy-vault, privy or water-closet or other receptable or place used for the deposit of night soil or other waste shall be situated to become foul, nauseous or offensive, and when in the opinion of the health officer or any of his subordinates any privy-vault, privy, water-closet or cesspool shall need cleaning or disinfecting, it shall be his duty to at once notify such owner, lessee, agent, tenant, occupant or other person having charge of the premises upon which such nuisance is situated to have such nuisance abated by disinfecting or cleaning as the case may be.

SEC. 4. No person or persons shall throw into or deposit in any water or privy closet, vault, sink, privy or cesspool any offal, ashes, garbage, swill, or other substance except that of which any such place is the appropriate receptable, and the owner, lessee, agent, tenant, occupant, or any other person having control of any building or premises to which such water or privy closet, vault, sink, privy or cesspool appertains, shall be considered and held responsible for any violation of this section.

SEC. 5. No privy-vault, sink, hole, or other place of deposit for night soil in the city shall be allowed by the owner, lessee, agent, tenant, or occupant of the premises upon which such privy-vault, sink, hole or place of deposit for night soil shall be situated to become filled within fifteen inches of the general surface of the ground in its immediate vicinity; nor shall such persons or either of them allow the contents of said privy vault, sink, hole, or other place of deposit for night soil to be drained into any hole or excavation in the ground; nor shall such persons or either or any of them allow the contents thereof to be covered with earth or other substances and allowed to remain in the ground, or distributed on the ground connected with the premises or on any other grounds within the corporation lines without a written permit from the health officer.

SEC. 6. No abandoned well shall be used as a sink, cesspool, or privy-vault, nor as a place of

deposit for any rubbish, waste or any filth of any kind.

SEC. 7. No person, company or corporation shall remove or cause to be removed or transported or handle the contents of any privy-vault, within the corporation limits of Massillon unless a permit to remove the same is first obtained from the health officer.

SEC. 8. Every permit given by the health officer for the removal of the contents of any privy-vault shall give the name of the person intending to do the work, describe the premises where the work is to be done, and state where the contents are to be deposited.

SEC. 9. Every person to whom such permit is granted shall make a return of every permit issued them within five days after work has been performed.

SEC. 10. Any person or persons, company or corporation, who shall violate or cause to be violated by agent or otherwise, any or either of the sections of this ordinance or any or either of the provisions thereof, or any or either of the orders, rules or regulations of the Board of Health, or who shall fail or neglect to comply with any or either of the requirements thereof by agent or otherwise, or shall obstruct the Board of Health or its officers in the discharge of their duties, on conviction thereof before the mayor's court or other court of competent jurisdiction shall be fined in any sum not exceeding fifty dollars and costs of prosecution.

SEC. 11. This ordinance shall be in force from and after its passage and publication.

Hog pens within corporate limits? About 70 (187 hogs). Ordinance requires a permit from Board of Health; otherwise forbids the keeping of hogs in the city.

Slaughter-houses? None.

What was done to remove or control these? They are forbidden within the city by order of Board of Health, but not by ordinance.

Dairies and milk supply inspected? No.

School-houses inspected? Yes.

Number of cases and deaths from infectious diseases: Diphtheria, 16 cases, 1 death; scarlet fever, 171 cases, 11 deaths; typhoid fever, 9 cases, 3 deaths; measles, 135 cases, 3 deaths; whooping cough, 1 case, no death.

What was done to prevent their spread? Physicians are required to report on blank at once; children of family affected are excluded from schools until physician certifies that they may safely return.

MARTIN'S FERRY—WILLIAM H. ORR, H. O.

Improvements in sewerage. Street paving with fire brick progressing rapidly, drainage and sewerage good. Other parts of the city have been greatly improved by surface drains and ditches. Much remains to be done in this respect in the suburbs.

Nuisances abated. Thirty-two privies cleaned or removed. Fifteen cellars, water removed and disinfected; disinfectants very generally used; many cess pools filled up; forty dead animals buried or cremated, streets and alleys policed and garbage removed or burned.

What has been done to control the privy-

vault nuisance? Nothing more than to notify property owners to keep them clean and in good condition. A copy of the rules and regulations of the Board of Health is furnished every family.

Hog pens within corporate limits? None now in use, hogs not being permitted in the city.

Slaughter-houses? None in city limits, two a short distance outside on a run leading through the city.

What was done to remove or control these? Suit was brought in common pleas court against owners, fines assessed and collected, one ordered to vacate, which was done, the other to clean up and thereafter allow no offal or filth to be deposited in run.

Dairies and milk supply inspected? Not at all, no inspector having been appointed.

School houses inspected? Yes, and find them in good condition as regards ingress and egress, ventilation and light. Locations high and airy.

Number of cases and deaths from infectious diseases: Typhoid fever, 15 cases, 5 deaths.

What was done to prevent their spread? All places where the attending physician apprehended danger were quarantined, and children of such families restrained from running at large or attending school until the danger was passed.

Special cause of ill health. There are some low places in the city limits that are difficult to properly drain. The rapid growth of the city however, is steadily improving this condition of things; the enforcement of the rules and regulations of the local as well as the State Board of Health, is having a good effect on the sanitary condition of the city.

MECHANICSBURG—DR. O. A. NINCEHELSE, H. O.

Nuisances abated. Forty-five. Consisting chiefly of overflowing privy vaults, filthy hog pens and manure. This does not include nuisances abated, due to a general notice given by mayor and Board of Health in May, 1890.

What has been done to control the privy-vault nuisance? Board has adopted a law requiring all vaults to be constructed with brick walls and cement, or the dry earth plan used.

Hog pens within corporate limits? About eighty. We have a law limiting to three the number of hogs that may be kept on one lot.

Slaughter-houses? One.

What was done to remove or control these? Require all offal to be removed without corporate limits.

School-houses inspected? Yes.

Number of cases and deaths from infectious diseases: Typhoid fever, 3 cases, no deaths; measles, 2 cases, no deaths.

What was done to prevent their spread? Isolation and disinfection.

MIAMISBURG—DR. W. S. BOOKWALTER, Clerk.

Improvements in sewerage. Have no sewerage other than surface drainage, which is good and satisfactory; consequently no improvements in that direction during the past year.

Nuisances abated. Thirty seven. Full vaults,

28; hog pens in bad condition, 3; manure piles, 2; filthy garbage piles, 4

What has been done to control the privy-vault nuisance? All persons are required to thoroughly disinfect their vaults, and keep the same in good sanitary condition.

Hog pens within corporate limits? Eight.

Slaughter-houses? Two.

What was done to remove or control these? Compelling owners to keep them in good sanitary condition.

Dairies and milk supply inspected? Have not.

School-houses inspected? Yes.

Number of cases and deaths from infectious diseases: Diphtheria, 4 cases, no deaths; scarlet fever, 15 cases, no deaths; typhoid fever 5 cases, 2 deaths.

What was done to prevent their spread. The houses where such diseases existed were cordoned, and the occupants, those being exposed to the disease, were compelled to stay within their own premises. All school children living in the same house where such disease existed were excluded from school until all danger of contagion was past.

MIDDLEPORT—JAY THOMAS, H. O.

Improvements in sewerage. Very little has been done.

Nuisances abated. A large number of privies have been condemned and abated.

What has been done to control the privy-vault nuisance? Nothing further than to fill up old ones and dig fresh nuisances.

Hog pens within corporate limits? About 45, and one wholesale.

Slaughter-houses? One.

What was done to remove or control these? One proprietor was indicted in the September term of court.

Dairies and milk supply inspected? No special test applied, but we are satisfied they are all right.

School-houses inspected? Yes; good improvement.

Number of cases and deaths from infectious diseases: Diphtheria, 2 cases, no deaths; scarlet fever, 3 cases, no deaths; typhoid fever, not reported, 4 deaths; measles, epidemic, 5 deaths; whooping cough, epidemic, 3 deaths.

What was done to prevent their spread? Quarantine.

Special cause of ill-health. Want of proper sewerage. This is alarming, but we hope that when this generation all die, the "new comers" will construct sewers.

MIDDLETOWN—DR. G. D. LUMMIS, H. O.

Improvements in sewerage. An ordinance has passed to construct a sewer through the principal part of our city. Bids will be opened this week, and the sewer will probably be completed this fall.

Nuisances abated. 119 privy-vaults and 10 sinks cleaned.

What has been done to control the privy-vault nuisance? Constructing a sewer to do

away with them in the closely populated portion of the city.

Hog pens within corporate limits? None.

Slaughter-houses? None.

What was done to remove or control these? An ordinance passed, prohibiting them within city limits.

Dairies and milk supply inspected? No.

School-houses inspected? No.

Number of cases and deaths from infectious diseases: Diphtheria, 13 cases, 2 deaths; scarlet fever, 1 case, no death; typhoid fever, 10 cases, 3 deaths; measles, 140 cases, no deaths; whooping cough, none reported, 1 death.

What was done to prevent their spread? Houses placarded for diphtheria.

MILLERSBURG—DR. J. E. WHITMAR, H. O.

Improvements in sewerage. We have no system of sewage, except from public buildings, which are in good condition. Our natural advantages for surface draining are good and the town is well drained.

Nuisances abated. None.

What has been done to control the privy-vault nuisance? Frequent cleaning and disinfecting.

Hog pens within corporate limits? A number in suburbs of town.

Slaughter-houses? Two located in outskirts of town.

What was done to remove or control these? Nothing.

Dairies and milk supply inspected? No.

School-houses inspected? Yes and recommended such alterations as we deemed necessary.

Number of cases and deaths from infectious diseases. Since my time in office (August) there has been but one death from the above causes, viz., typhoid fever.

MINERVA—O. W. KURTZ, Secretary.

Nuisances abated. We have had but little difficulty along this line, only a few nuisances of minor importance were referred to the Board.

What has been done to control the privy-vault nuisance? Nothing has as yet been done to adopt a uniform system of vaults.

Hog pens within corporate limits? Probably forty.

Slaughter-houses? None.

Dairies and milk supply inspected? No.

School-houses inspected? Our school building has not been inspected for the reason that it is kept in good condition.

MT. PLEASANT—DR. J. A. MCGLENN, H. O.

Nuisances abated. None.

What has been done to control the privy-vault nuisance? They have been inspected and about all of them cleaned.

Hog pens within corporate limits? There are 48 hog pens within the corporation, most of which are clean as possible.

Slaughter-houses? Two; one bad, the other is not used very much.

What was done to remove or control these? Nothing. The Board of Health has been organized, but a little over a month, and we have not had time yet to look into such matters.

Dairies and milk supply inspected? No.

School-houses inspected? No.

Number of cases and deaths from infectious diseases: Diphtheria, 2 cases, no deaths; typhoid fever, 18 cases, 2 deaths; whooping cough, 5 cases, no deaths.

What was done to prevent their spread? There was an attempt made during the typhoid fever epidemic to have privy-vaults cleaned, but in the majority of cases no attention was paid to the order.

MT. VERNON—DR. BALDWIN B. SCOTT, H. O.

Improvements in sewerage. We have recently adopted a general sewerage system, and the work is now in progress, and it will undoubtedly be in operation by next season.

Nuisances abated. Can not say, for an accurate account was not kept, but think that not less than 150 for we had near 100 new privy-vaults put in the past season.

What has been done to control the privy-vault nuisance? Put in new when the old are not in sanitary condition; will control in the future by sewerage.

Hog pens within corporate limits? Do not know; no reports have been made to this office. Slaughter-houses? None.

What was done to remove or control these? Nothing.

Dairies and milk supply inspected? They have not.

School-houses inspected? Yes.

Number of cases and deaths from infectious diseases: Diphtheria, 6 cases, 2 deaths; scarlet fever, 21 cases, 2 deaths; typhoid fever, 6 cases, no deaths.

What was done to prevent their spread? The houses were placarded and the children prohibited from attending school or associating with other children—in fact, quarantined as far as possible without a guard.

Special cause of ill-health. There was a large pond occupying about two acres of ground and it has been drained completely at the instance of the Board of Health.

NAVARRE—PETER B. WELCH, H. O.

Nuisances abated. We have abated several nuisances, consisting of 10 hog pens, 2 privy-vaults, and also some stagnant water within this corporation—and not least of all, our village prison.

What has been done to control the privy-vault nuisance? We gave our people our rules adopted by the Board of Health, giving space and dimensions of the vaults, and the same is generally observed.

Hog-pens within corporate limits? About fifty.

Slaughter-houses? None, but some close by.

What was done to remove or control these? We notify the township trustees when the same becomes obnoxious.

Dairies and milk supply inspected? Not yet.

School-houses inspected? We have, and found them not according to the requirements of the statute, inasmuch as the doors open in-

wardly on first and second stories, and the ventilation is not good; heated by stoves, which is always objectionable; we notified the school board of said facts, but no attention was paid to the same.

Number of cases and deaths from infectious diseases: Diphtheria, 1 case, no deaths; scarlet fever, 10 cases, no deaths; typhoid fever, 4 cases, no deaths.

What was done to prevent their spread? I have give instruction to our doctors to warn the parents and friends of the person to destroy the excrement of the patients and keep people from visiting those places, and keep the children from attending school.

NELSONVILLE—DR. CHAS. W. CABLE, H. O.

Nuisances abated. Privy-vaults and pig pens too numerous to mention.

What has been done to control the privy-vault nuisance? Nothing.

Hog-pens within corporate limits? Hundreds.

Slaughter-houses? Five.

What was done to remove or control these? Nothing.

Dairies and milk supply inspected? No.

School-houses inspected? No.

Number of cases and deaths from infectious diseases: Diphtheria, 20 cases, 6 deaths; typhoid fever, 4 cases, 1 death; whooping cough, 8 cases, 2 deaths.

What was done to prevent their spread? School-houses disinfected, houses placarded and residents quarantined.

Special cause of ill-health. Filthy pig pens. An ordinance has been passed to take effect Dec. 25, 1890, prohibiting the keeping of swine within the corporation.

NEVADA—W. L. BLAIR, H. O.

Improvements in sewerage. Sewers are in good condition; no improvements this year.

Nuisances abated. None.

What has been done to control the privy-vault nuisance? All parties are required to keep them well cleaned.

Hog pens within corporate limits? Twenty-five.

Slaughter-houses? None.

What was done to remove or control these? All parties having them within corporate limits are required to keep them well cleaned and free from noxious odors.

Dairies and milk supply inspected? Yes.

School-houses inspected? Yes, and placed in best condition for health and comfort.

Number of cases and deaths from infectious diseases: None.

NEW BREMEN—DR. M. S. EKERMEYER, H. O.

Nuisances abated. Only a few, and they were from overflowing privy-vaults.

What has been done to control the privy-vault nuisance? We have them inspected by our sanitary police, and if found to be a nuisance have them ordered corrected.

Hog pens within corporate limits? About twenty-five.

Slaughter-houses? One in the corporate limits.

What was done to remove or control these? They are kept clean; those that are not we order cleaned.

Dairies and milk supply inspected? Milk inspected; quite good.

School-houses inspected? Yes; we are having the Akron heating and ventilating system put in the building this fall.

Number of cases and deaths from infectious diseases: Scarlet fever, 1 case; no deaths.

NEW CONCORD—W. S. KLINE, H. O.

Nuisances abated. The Board of Health made an inspection last spring and ordered 80 nuisances abated, consisting of hog pens, privies, manure piles removed. This order was never enforced. All the citizens without regard to condition were up in arms against any thing being done. The Board of Health gave up and quit.

What has been done to control the privy-vault nuisance? Nothing.

Hog pens within corporate limits? About thirty.

School-houses inspected? No; it is not considered in good taste to inspect any thing in this community.

Number of cases and deaths from infectious diseases: Typhoid fever, 7 cases, 2 deaths.

What was done to prevent their spread? Nothing.

Special cause of ill health. Our village is full of hogs and cows; filth of all kinds is thrown out in the streets and alleys. There is no attention whatever paid to the sanitary condition. In the spring, when the Street Commissioner cleans out the gutters of streets and alleys, the filth found there is thrown out in the streets and alleys and allowed to steam and stink.

NEW LISBON—JOHN CAVANAGH, H.

Improvements in sewerage. Sewerage constructed during the year to the amount of 6,500 feet, ranging from 8-inch to 20-inch pipe, which will add greatly to the health of our already healthy town; but think that 8-inch is too small.

Nuisances abated. 111 nuisances abated. 30 written and 81 verbal notices served, in the shape of sink-holes, manure piles, dead dogs, cats, chickens and rabbits.

What has been done to control the privy-vault nuisance? 29 privy-vaults cleaned in the night season, and the contents carried to the outside of the borough and buried.

Hog pens within corporate limits? Twenty-six granted under permits, and kept as clean as hog pens can be.

Slaughter-houses? Three slaughter-houses, perfect nuisances; complained of every day.

What was done to remove or control these? The mayor refuses to grant summons and lets them throw their filth into the runs on which they are built, contaminating the water so that the stock along its banks will not drink it. They should be removed at once.

Dairies and milk supply inspected? There

is but one dairy, which is outside of town, and it is kept clean and healthy.

School-houses inspected? Have been examined regularly, and have good sewerage system and well ventilated rooms. Rooms heated by steam furnace. When diphtheria prevailed school was stopped for two weeks; fumigated school-house twice.

Number of cases and deaths from infectious diseases: Diphtheria, 11 cases, 2 deaths; scarlet fever, 12 cases, no deaths; typhoid fever, 12 cases, 4 deaths; measles, 1 case, no deaths.

What was done to prevent their spread? The houses in each case were visited by the health officer and placarded; all the children of such houses were stopped from going to the schools until after three weeks of convalescence, and with a certificate from the attending physician. In case of death, houses fumigated.

NEW LONDON—DR. N. O. ALLEN, H. O.

Improvements in sewerage. Sewers have been put down by property-holders to carry stagnant water from their premises where it backed up in the cellars.

Nuisances abated. Sixty written notices have been served, mostly neglected privys and neglected hog pens and barn-yards, and places where water becomes stagnant.

What has been done to control the privy-vault nuisance? They have been notified to clean when full, and the Board has seen that they have done it.

Hog pens within corporate limits? Twenty-five.

Slaughter-houses. None.

What was done to remove or control these? Nothing done except to stop butchers from slaughtering inside the corporation limits.

Dairies and milk supply inspected? They have not.

School-houses inspected? Yes.

Number of cases and deaths from infectious diseases: Diphtheria, 1 case, no deaths; scarlet fever, 17 cases, 1 death; typhoid fever, 2 cases, no deaths; whooping cough, 5 cases, no deaths.

What was done to prevent their spread? The houses were placarded and notice printed on the card that no person or persons shall be permitted to enter except the nurse and the attending physician, and it had the desired effect.

Special cause of ill health. There has been no predominating disease (but we have a town which is very flat and the streets have a dense shade and it takes the streets too long to dry; but they are cutting down and trimming the trees, and agitating more sewerage, which will be better for the public health of the town).

NEW PARIS—DR. J. S. ROBINSON, *President*.

Nuisances abated. None.

What has been done to control the privy-vault nuisance? Nothing.

Hogpens within corporate limits? Between one and two hundred.

Slaughter-houses? Two.

What was done to remove or control these? Nothing.

Dairies and milk supply inspected? No.

School-houses inspected? No.

Number of cases and deaths from infectious diseases: Typhoid fever, 2 cases, one death; measles, 15 cases, no deaths.

What was done to prevent their spread? Nothing except kept out of school.

NEW RICHMOND—DR. T. J. MULLEN, H. O.

Improvements in sewerage. None the past year.

Nuisances abated. About six pig pens and cow stables.

What has been done to control the privy-vault nuisance? About 25 new ones have been put down.

Hog pens within corporate limits? A very few pig pens, and are kept pretty clean.

Slaughter houses? None.

What was done to remove or control these? They were removed several years ago.

Dairies and milk supply inspected? We have none within our limit.

School-houses inspected? I have not. They are reported in good condition.

NEW WASHINGTON—J. F. KIMERLINE, H. O.

Improvements in sewerage. Tile sewer put down.

Nuisances abated. A number of hog pens and privy-vaults abated; others put in good condition.

What has been done to control the privy-vault nuisance? Some 20 cleaned, and rest ordered disinfected by board.

Hog pens within corporate limits? About fifty.

Slaughter houses? Two.

What was done to remove or control these? By order of board one slaughter-house has moved from main portion of village; other kept in good condition now.

Dairies and milk supply inspected? No.

School-houses inspected? Yes. All in good condition.

NORTH BALTIMORE—DR. J. R. ARCHER, H. O.

Improvements in sewerage. One and one-half miles of new sewerage.

What has been done to control the privy-vault nuisance? Not any thing.

Hog pens within corporate limits? Seventy-five.

Slaughter-houses? Not any.

What was done to remove or control these? Declared a nuisance; ordered removed out of corporation.

Dairies and milk supply inspected? No.

School-houses inspected? No.

Number of cases and deaths from infectious diseases: Diphtheria, 25 cases, 5 deaths; scarlet fever, 20 cases, 3 deaths; typhoid fever, 15 cases, 1 death.

What was done to prevent their spread? Quarantined.

NORWALK—J. A. JONES, H. O.

Improvements in sewerage. No improvements during current year; city sewered fairly well.

Nuisances abated. 149, mostly privies.

What has been done to control the privy-vault nuisance? Stringent ordinances and regulations have been passed as to construction and cleaning, which have been strictly enforced.

Hog pens within corporate limits? None allowed.

Slaughter-houses? None.

What was done to remove or control these? Have heretofore been controlled, but are now removed entirely by ordinance.

Dairies and milk supply inspected? They have.

School-houses inspected? We have.

Number of cases and deaths from infectious diseases: Diphtheria, 4 cases, no deaths; scarlet fever, 7 cases, no deaths; typhoid fever, 24 cases, 1 death; measles, 6 cases, no death.

What was done to prevent their spread? Doors have been placarded, ingress and egress has been prevented, property cleaned and disinfected.

OBERLIN—THOS. R. MAYHEW, H. O.

Improvements in sewerage. Have no general sewerage system, but expect to make a thorough survey this winter.

Nuisances abated. Perhaps 20, all of a minor character.

What has been done to control the privy-vault nuisance? We have but few vaults proper, mostly constructed upon the surface; mostly removed in the early morning or evening and mixed with earth, and so disposed of.

Hog pens within corporate limits? Very few in all, and they are on the outskirts of the village. Prohibited in most of the village.

Slaughter-houses? One in the extreme limits; others outside.

Dairies and milk supply inspected? Not inspected; no complaint.

School-houses inspected? Have not; but hear no complaint.

Number of cases and deaths from infectious diseases: Diphtheria, mild, 2 cases, no deaths; scarlet fever, 7 cases, no deaths; typhoid fever, 4 cases, 1 death; measles, 12 cases, no deaths; whooping cough, 20 cases, no deaths.

What was done to prevent their spread? Great care on part of physicians and Health Officer.

ORRVILLE—DR. S. P. GRILL, H. O.

Nuisances abated. About 50. Privies, pig pens, weeds, etc.

What has been done to control the privy-vault nuisance? Nothing.

Hog pens within corporate limits? About fifty.

Slaughter-houses? None.

Dairies and milk supply inspected? No.

School-houses inspected? Yes.

Number of cases and deaths from infectious diseases: Scarlet fever, 10 cases, no deaths; typhoid fever, 2 cases, 1 death; measles, 8 cases, no deaths.

OTTAWA—DR. C. E. BEARDSLEY, H. O.

Improvements in sewerage. With very little improvement over the old system of sewer tile,

with exit in our small river, and will not for some time to come. The people rule here. Brains or no brains.

Nuisances abated. 150 privy-vaults and 10 pig styes; drainage of stagnant waters, and general street and alley cleaning. The number of smaller nuisance abated, as deposits of kitchen refuse, into alleys, etc., were not noted.

What has been done to control the privy-vault nuisance? Where a vault had to be cleaned the debris was carted off in tight barrels (for that purpose), and buried $\frac{1}{2}$ to $\frac{3}{4}$ mile from the village.

Hog pens within corporate limits? Ten. All had to be abated during the hot weather.

Slaughter-houses? One slaughter-house and two who slaughter, where they buy stock.

What was done to remove or control these? We allow no one to slaughter within the corporate limits, unless he occupies the slaughter-house. The slaughter-house was built by compulsion of the Health Board.

Dairies and milk supply inspected? One farm dairy. This has been inspected and found to be pure milk, fairly good.

School-houses inspected? I have, and find it badly ventilated and heated, etc. A new one will be built next year.

Number of cases and deaths from infectious diseases: Diphtheria, 2 cases, 1 death; scarlet fever, 4 cases, no deaths; typhoid fever, 5 cases, 2 deaths.

What was done to prevent their spread? Isolating and strictly quarantining the premises on which any case of infectious or contagious disease made appearance.

PAINESVILLE—S. D. BARBER, H. O.

Improvements in sewerage. Have $2\frac{1}{4}$ miles already constructed and one mile under contract to be finished this fall.

Nuisances abated. Ninety-seven. Privy-vaults, 62; hog pens, 7; kitchen drains, 3; barn yards, 5; cesspools abandoned, 13; garbage piles removed, 4; slaughter-houses, 2; phosphate storage house removal, 1.

Hog pens within corporate limits? Seventy-five.

Slaughter-houses? Two.

Dairies and milk supply inspected? Yes.

School-houses inspected? Yes.

Number of cases and deaths from infectious diseases: Diphtheria, 8 cases, 2 deaths; scarlet fever, 5 cases, no deaths; Measles, 129 cases, 1 death.

What was done to prevent their spread? Strictly enforcing rules of the Board.

PIQUA—DR. R. M. O'FARRALL, H. O.

Improvements in sewerage. Council has just contracted for three-quarters of a mile of main sewer.

Nuisances abated. One hundred and forty, principally foul privies, hog pens, collection of garbage, filthy alleys and premises, cow stables, etc.

What has been done to control the privy-vault nuisance? Require vault permit, and insist on cementing of all new vaults.

Hog-pens within corporate limits? Not over one dozen. Abolished most of them last summer.

Slaughter-houses? Four.

What was done to remove or control these? One was removed last summer. The others were required to conform to the Board's rules as to construction, manner of conducting and disinfection.

Dairies and milk supply inspected? No, but we intend to inspect dairies soon.

School-houses inspected? Yes.

Number of cases and deaths from infectious diseases: Diphtheria, 25 cases, 6 deaths; scarlet fever, 13 cases, no deaths; typhoid fever, large number of cases, 8 deaths; measles, 3 deaths.

What was done to prevent their spread? Physicians report diphtheria and scarlet fever, houses are placarded and disinfected after death or recovery, funerals private. In April and May we had a threatening epidemic of diphtheria, which was successfully controlled after twenty cases and four deaths had been reported.

Special cause of ill health. The conjunction of underground privy-vaults and main water supply from wells. We have strongly urged council to inaugurate a sewerage system, which has been begun in a very imperfect and incomplete way.

We attempt to enforce our rule as to cementing of vaults as thoroughly as possible.

PLYMOUTH—DR. R. D. SYKES, H. O.

Nuisances abated. We have tried to have a general cleaning up.

What has been done to control the privy-vault nuisance? Those that have been a nuisance, have been abated.

Hog pens within corporate limits? Don't know the exact number. They are not restricted, only made to be kept clean.

Slaughter-houses? Two.

What was done to remove or control these? In the summer time the butchers are compelled to slaughter in the country.

Dairies and milk supply inspected? No.

School-houses inspected? Yes.

Number of cases and deaths from infectious diseases: Typhoid fever, 6 cases, no deaths.

PORT WASHINGTON—DR. F. G. HELMS, H. O.

Nuisances abated. Four hog pens, 3 privy-vaults and 1 stable yard.

What has been done to control the privy-vault nuisance? All privy-vault nuisances not otherwise abated have been in accordance with the law.

Hog pens within corporate limits? I do not know the number.

Slaughter-houses? None.

What was done to remove or control these? By order of our council they were placed outside of our corporate limits.

School-houses inspected? Yes.

Number of cases and deaths from infectious diseases: Diphtheria, 1 case, no deaths; scarlet fever, 5 cases, no deaths; typhoid fever, 10 cases, no deaths.

What was done to prevent their spread? The

sanitary laws laid down by our Board of Health, which were taken from the State Board of Health, and were carried out as nearly as possible.

PORTSMOUTH—DR. C. C. FULTON, H. O.

Improvements in sewerage. Very little done; last year's work improved the sewerage so that there was little required.

Nuisances abated. Some 50 abated—mostly foul vaults, gutters, hog pens, etc.

What has been done to control the privy-vault nuisance? Nothing since last report.

Hog pens within corporate limits? The board made an attempt to abolish all, but failed. Slaughter-houses? None.

What was done to remove or control these? Nothing.

Dairies and milk supply inspected? Yes; found to be good in nearly all cases.

School-houses inspected? Yes.

Number of cases and deaths from infectious diseases: Diphtheria, 18 cases, 3 deaths; scarlet fever, 26 cases, 2 deaths; typhoid fever, 6 deaths; measles, 15 cases, 1 death.

What was done to prevent their spread? Quarantined, placarded, etc., for diphtheria and scarlet fever.

RAVENNA—JOSEPH GLEDHILE, H. O.

What has been done to control the privy-vault nuisance? Mostly filled and the dry earth plan used.

Hog pens within corporate limits? About fifty.

Slaughter-houses? None.

What was done to remove or control these? Nothing but to keep them clean.

Dairies and milk supply inspected? Yes.

School-houses inspected? No; do not understand that corporations of this size have to.

Number of cases and deaths from infectious diseases: Diphtheria, 1 case, no death; scarlet fever, 2 cases, no deaths; typhoid fever, 4 cases, no deaths.

What was done to prevent their spread? Placarding and disinfecting and notifying schools.

READING—F. X. ANKENBAUER, H. O.

What has been done to control the privy-vault nuisance? We have used all efforts for securing cemented privy-vaults, and made 12 of stone well cemented.

Hog pens within corporate limits? One hundred and twenty-seven pens and 273 hogs. The most of them are not going to keep any more.

Slaughter-houses? Three.

What was done to remove or control these? We made them keep clean, otherwise leave the village. I think in the spring we will have them out of the village.

Dairies and milk supply inspected? Yes, last July. We will inspect them again, perhaps, next week.

School-houses inspected? Yes, and found them all in good order, especially the public school; there is none in the State better; all the latest improvements. It was erected 1 year ago and cost about \$30,000.

Number of cases and deaths from infectious diseases: Typhoid fever, 1 case, 1 death.

What was done to prevent their spread?

Nothing. The doctor did not report the case and I did not know any thing about it, not until the young man died.

RICHWOOD—DR. J. OATLEY, H. O.

Nuisances abated. Bad privies abated, 25; bad hog pens, 6; dead animals, 2; decaying vegetation from the rear of the groceries and other premises. The town looked over, and all disease-breeding matter ordered removed.

What has been done to control the privy-vault nuisance? No regular rule, but all dig good, deep vaults, and when full a new one is dug and the old one filled up securely.

Hog pens within corporate limits? Fifty.

Slaughter-houses? Two. Our butchers are careful, clean men, and keep clean.

What was done to remove or control these? Nothing more than to visit them occasionally and enjoin cleanliness or removal.

Dairies and milk supply inspected? No.

School-houses inspected? Yes; its sanitary condition is good.

Number of cases and deaths from infectious diseases: Diphtheria, 2 cases, no deaths; scarlet fever, 1 case, no death; typhoid fever, 30 cases, two deaths.

What was done to prevent their spread? Houses placarded and quarantined.

RIPLEY—DR. J. C. WINTERS, H. O.

Nuisances abated. Have kept no record.

What has been done to control the privy-vault nuisance? Having them cleaned.

Hog pens within corporate limits? Not many.

Slaughter-houses? Two.

What was done to remove or control these? By burial of offal.

Dairies and milk supply inspected? Our milk comes from the country.

School-houses inspected? Yes.

Number of cases and deaths from infectious diseases: Scarlet fever, 1 case, no deaths; typhoid fever, 3 cases, no deaths; whooping cough, 25 cases, 1 death.

What was done to prevent their spread? We have had so little and cases were so mild there was comparatively nothing done and nothing required.

ROCK CREEK—J. C. KNOWLTON, H. O.

Nuisances abated. Six; four privies and two hog pens.

What has been done to control the privy-vault nuisance? Ordered discontinued or to be walled and cemented.

Hog pens within corporate limits? Twelve.

Slaughter-houses? One.

What was done to remove or control these? Refuse ordered buried or burned.

Dairies and milk supply inspected? Yes.

School-houses inspected? Yes, and find them well ventilated and heated; cellar and out-houses in proper condition.

Number of cases and deaths from infectious

diseases: Diphtheria, 3 cases, 1 death; measles, 52 cases, no deaths; whooping cough, 7 cases, no deaths.

What was done to prevent their spread? Notices posted at patients' residence and inmates kept from school.

SABINA—DR. A. J. GASKINS, H. O.

Improvements in sewerage. There have been about 200 rods of sewer put in, and as much more recommended by Board of Health.

What has been done to control the privy-vault nuisance? Ordered all vaults cleaned and filled or cemented and made water tight, or boxes provided. All have been cleaned, but some failed to cement or provide box.

Hog pens within corporate limits? Near 30 or 40.

Slaughter-houses? Two.

What was done to remove or control these? Had them cleaned and plenty of lime used.

School-houses inspected? No.

Number of cases and deaths from infectious diseases: Typhoid fever, 4 cases, 1 death.

What was done to prevent their spread? A general cleaning up of the town.

Special cause of ill health Drinking water, which is used, is mostly surface water, and gets very impure in dry weather when the wells get low. We are working on a thorough system of sewerage.

ST. CLAIRSVILLE—DR. DALE L. WALKER, H. O.

Improvements in sewerage. The town has for the last six months been undergoing general improvements in sewerage.

Nuisances abated. Seven, mainly privy-vaults.

What has been done to control the privy-vault nuisance? The council has passed an ordinance requiring the contents moved every month.

Hog pens within corporate limits? Seventy-six.

Slaughter-houses? Two.

What was done to remove or control these? Nothing at all.

Dairies and milk supply inspected? Yes.

School-houses inspected? Yes.

Number of cases and deaths from infectious diseases: Diphtheria, 19 cases, 5 deaths; scarlet fever, 22 cases, 3 deaths; typhoid fever, 36 cases, 9 deaths; measles, 13 cases, 3 deaths; whooping cough, 23 cases, 1 death.

What was done to prevent their spread? Every person was compelled to clean his or her premises, and notice was put in papers giving instructions, etc.

ST. MARY'S—DR. W. E. SCHOONOVER, H. O.

Nuisances abated. None.

What has been done to control the privy-vault nuisance? Nothing.

Hog pens within corporate limits? A great many of them.

Slaughter houses? Two.

What was done to remove or control these? Nothing.

Dairies and milk supply inspected? No.

School-houses inspected? No.

Number of cases and deaths from infectious diseases: Diphtheria, several cases, no deaths; scarlet fever, several cases, no deaths; typhoid fever, several cases, no deaths.

What was done to prevent their spread? Nothing.

ST. PARIS—DR. C. A. OFFENBACHER, H. O.

Improvements in sewerage. Have no sewer system; have an open branch extending the entire length of town, which was well cleaned during the summer.

Nuisances abated. Two hog pens abated, ten privies cleaned.

What has been done to control the privy-vault nuisance? Practically, nothing.

Hog-pens within corporate limits? Fifty.

Slaughter-houses? None.

Dairies and milk supply inspected? No. Require parties selling milk to file certificate of health and cleanliness.

School-houses inspected? No. We are building a new house which is not yet completed; will inspect when finished.

Number of cases and deaths from infectious diseases: Scarlet fever, six cases, no deaths; typhoid fever, one case, one death; whooping cough, 100 cases, no deaths.

What was done to prevent their spread? Quarantine for scarlet fever. Whooping cough not reported by physicians or any one else, until the whole school was affected; generally mild, and nothing done.

SALEM—DR. T. T. CHURCH, H. O.

Improvements in sewerage. No improvements have yet been made.

Nuisances abated. Three hundred and fifty; cleaning of privies, yards, cellars, wells, alleys, and removing dead animals, rubbish and weeds. In addition, many nuisances were abated without the formality of issuing notices, by merely calling the attention of the property owner to their existence.

What has been done to control the privy-vault nuisance? All vaults must be constructed water tight, of which there are not many in the town. An increasing number of people are having the water closet in the house, and the rest have the old fashioned privy in the back yard, which we try to have cleaned at least once a year.

Hog pens within corporate limits? We have an ordinance against keeping hogs within the city limits except by permit from the Board of Health. These permits are only issued to people living on the edge of town, or removed a good distance from any neighbor.

Slaughter-houses? None.

Dairies and milk supply inspected? We had a milk and dairy inspector during April, May and June.

School-houses inspected? Yes.

Number of cases and deaths from infectious diseases: Diphtheria, 1 case, no death; scarlet fever, 9 cases, no deaths; typhoid fever, 56 cases, 7 deaths; measles, 94 cases, no deaths.

What was done to prevent their spread? In cases of diphtheria and scarlet fever, placards were placed on the houses to give notice of the sickness. The premises were kept as well disinfected as possible, and other children detained at home from school. In case of measles, the number reported is inaccurate, as parents made no effort to prevent their children contracting the disease, and frequently did not employ a physician.

Special cause of ill health. We have no sewerage system, and many people suffer in consequence. There are two or three storm water courses in town, and these are utilized to carry off all manner of house drainage. What we call The Flat, is flooded every time it rains, and quite a pond remains between storms. The county commissioners have undertaken to drain this for us, and our council has ordered a sanitary survey of the town to be made by our civil engineer, preparatory to adopting some sewer system. In the mean time our water courses, and street and alley gutters are pressed into the service of removing our liquid waste.

SANDUSKY—DR. ELWOOD STANLEY, H. O.

Improvements in sewerage. New sewerage in 1890, 4½ miles; previous sewerage, 17½ miles. This is the amount of sewerage completed to this date.

Nuisances abated. Nuisances in streets and alleys removed—1,050—such as rubbish of all kinds. Ten cellars drained by sewerage and placed in good sanitary condition. These cellars were filled with water, mud and other material. Twenty-one cellars cleaned and disinfected.

What has been done to control the privy-vault nuisance? To clean and disinfect to the number of 1,150 vaults since March 1, 1890. Are now enforcing the use of dry earth boxes.

Hog pens within corporate limits? Five hundred and sixteen within the hog limits.

Slaughter-houses? None in the city limits. Are not permitted.

Dairies and milk supply inspected? Yes. Eighty-two venders of milk. Milk tested every month.

School-houses inspected. Yes, to some extent.

Number of cases and deaths from infectious diseases: Diphtheria, 16 cases, 9 deaths; scarlet fever, 14 cases, 2 deaths; typhoid fever, 6 cases, 3 deaths; measles, 2 cases, no deaths.

What was done to prevent their spread? Prohibiting public funerals at house or church; removing children from house where it prevailed effectually disinfecting dwellings where sickness existed. The Board of Health appointed Nov. 18, 1889—no business transacted till March, 1890, of any account.

MIDWAY (Sedalia P. O.)—DR. E. B. MEADE, H. O.

Improvements in sewerage. Quite an amount of sewer tile put in to drain streets, alleys and dwelling places, and old drains examined and repaired; a number of sinks put in and a general course of drainage followed up.

Nuisances abated. A committee was appointed and all stables, henneries and all gar-

bage piles were investigated and cleaned up, and the parties were compelled to keep clean.

What has been done to control the privy-vault nuisance? Some parties were requested to clean out filthy privies and did so without any trouble.

Hog pens within corporate limits? Four or five.

Slaughter-houses? One.

What was done to remove or control these? The owners of hog pens were requested to keep pens clean or they would be cleaned up and expense of such charged to owners, and if they did not keep them clean they would be removed as nuisances.

School-houses inspected? Not especially, but as a member of the Board of Health is principal, it is expected that he will report if there is any cause.

Number of cases and deaths from infectious diseases: Scarlet fever, 2 cases, 1 death; measles, 25 or 30 cases, no deaths.

What was done to prevent their spread? In scarlet fever the house was placarded and quarantined so far as the law would permit, but with some people it caused much trouble.

SHAWNEE—CHAS. E. WHITTINGTON, Clerk.

Nuisances abated. Full privy-vaults, nine; filthy drains, five; basement, one; hogs buried, two; horse buried, one; hog pen removed, one; manure pile removed, one.

What has been done to control the privy-vault nuisance? Dig new vaults according to law when possible. If not, they are dug the old way in the earth.

Slaughter-houses? Three outside corporation.

School-houses inspected. No.

SHELBY—DR. M. T. LOVE, H. O.

Nuisances abated. Hog pens and privy-vaults are the principal nuisances that have been abated; not as many as last year; no record kept of the number.

What has been done to control the privy-vault nuisance? Frequent cleaning.

Hog pens within corporate limits? Very few. When they become a nuisance they are ordered kept in order or removed.

Slaughter-houses? None.

What was done to remove or control these? Kept clean and deodorized.

School-houses inspected? Yes; sanitary condition of school first-class, one defect found in privy-vault and that was ordered corrected at once.

Number of cases and deaths from infectious diseases: Scarlet fever, 3 cases, no deaths; typhoid fever, 2 cases, no deaths; whooping cough, 1 case, no death.

What was done to prevent their spread? Disinfection of clothing and stools; isolation of patient from strangers; other members of the family kept from school.

SIDNEY—DR. EDWIN LE FEVRE, H. O., since August 1, 1890.

Improvements in sewerage. None, I believe;

have but a small amount of underground sewerage.

Nuisances abated. Filthy privy-vaults, cellars, yards, alleys, etc.; have not kept record of number of these during past year.

What has been done to control the privy-vaults nuisance? Order has been made that persons wishing to clean vaults must get permit from Health Officer. Dumping ground has been leased.

Hog pens within corporate limits? None allowed.

Slaughter-houses? None.

What was done to remove or control these? Committee from Board of Health investigated them; all outside of corporation.

Dairies and milk supply inspected? Yes, and report made in county papers. We now have a food inspector whose duty it is to look after meat, milk and other foods—under direction of the Board of Health.

What was done to prevent the spread of infectious diseases? All are placarded, and all persons from the house are kept out of schools, and in case of death from diphtheria or scarlet fever, such precautions as are ordered by the State Board are adopted.

SOUTH CHARLESTON—DR. M. H. COLLINS, H. O.

What has been done to control the privy-vault nuisance? We order them kept clean.

Hog pens within corporate limits? Twenty, and are kept quite clean.

Slaughter-houses? One in town and one in country (1 mile).

What was done to remove or control these? Nothing.

Dairies and milk supply inspected? We have two dairies, and do not think they need inspection.

School-houses inspected? Yes.

Number of cases and deaths from infectious diseases: Typhoid fever, 1 case, no death.

SPRINGBORO—DAVID MERING, H. O.

Improvements in sewerage. No improvements. The drains are kept clean.

Nuisances abated. None.

What has been done to control the privy-vault nuisance? The vaults are abolished. Boxes are substituted in some cases, and all are kept clean.

Hog pens within corporate limits? About 30. Slaughter-houses? One.

What was done to remove or control these? Thoroughly cleaned daily, and especially the slaughter-house.

School-houses inspected? Yes; ventilation about the average; privies are well cared for. We have a physician on the school board who is lively and conscientious.

Number of cases and deaths from infectious diseases: Scarlet fever, 6 cases, no deaths; typhoid fever, 3 cases, 1 death; measles, 4 cases, no deaths; whooping cough, 10 cases, no deaths.

What was done to prevent their spread? General care, only.

Special cause of ill-health. The slaughter-

house was the sore, but it has been so carefully handled that we hear of no complaint.

SPRINGFIELD—DR. HENRY H. SEYS, H. O.

Improvements in sewerage. None. Rather worse, in as much as more connections have been made with large, rough, uncemented drains discharging into a small water course, ending above a dam almost in the center of the city, or discharging into Lagonda creek. Nearly all the sewage is retained in these two water courses during the hot and dry months.

Nuisances abated. Can not state in exact numbers. Have compelled the cleaning of over 100 privy-vaults, 27 hog pens, cisterns and gutters cleaned, hog pens removed, etc., etc.

What has been done to control the privy-vault nuisance? Nothing, except using every means at my control to keep them in as good sanitary condition as possible, by cleaning and disinfecting.

Hog pens within corporate limits? Twenty-seven known. Number probably much larger.

Slaughter-houses? Three.

What was done to remove or control these? Nothing to remove. Have not had a complaint during the past year as to the condition. Are kept fairly clean and in good condition.

Dairies and milk supply inspected? No inspection of dairies. Milk tested in some 20 or 30 cases. Found uniformly of good quality.

School-houses inspected? Yes, most all of them. Condition good as to light, and fairly so as to heating. Bad as to ventilation and condition of privies. Some improvements have been made during past summer. Results not known yet.

Number of cases and deaths from infectious diseases: Diphtheria, 114 cases, 12 deaths; scarlet fever, 73 cases, 3 deaths; typhoid fever cases—no record kept as to number of cases for reasons given below, 26 deaths; measles, 49 cases 1 death; whooping cough, 4 cases, no deaths.

What was done to prevent their spread? For diphtheria, scarlet fever, measles and whooping cough, have had houses placarded, keeping other members of family from school, and in some cases had houses thoroughly disinfected. Nothing as to typhoid fever, except warning against drinking well water, which was generally disregarded. Have not attempted to determine number of typhoid fever cases. Physicians infrequently report, and do not, I think, discriminate as to the varied forms of fever sufficiently to permit statistics to be of any value.

Special cause of ill health? No special cause. Filthy, uncemented privy vaults, contaminating wells: drinking of well water so fouled, and the discharge of sewage into Lagonda creek and Mill run, in the center of the city, are unquestionably the most potent causes of ill health that we have.

STEBENVILLE—DR. A. A. ELLIOTT.

Improvements in sewerage. About one-half mile of main sewer built, and buildings along its course connected with it.

Nuisances abated. The sanitary police have looked after offensive alleys and vaults, and had them cleaned.

What has been done to control the privy-vault nuisance? Nothing.

Hog pens within corporate limits? A goodly number.

Slaughter houses? Several.

What was done to remove or control these? Nothing.

Dairies and milk supply inspected? No.

School-houses inspected? No.

Number of cases and deaths from infectious diseases: No means of knowing any thing official of the deaths or their causes. No reports or records have been made.

SUNBURY—DR. J. H. GERHARDT, H. O.

What has been done to control the privy-vault nuisance? No privy-vault shall be built unless it is water tight, and sufficiently elevated above the surface as to prevent overflow of surface water.

Hog pens within corporate limits? About 10.

Slaughter-houses? Not any.

Dairies and milk supply inspected? No.

School-houses inspected? Yes.

Number of cases and deaths from infectious diseases: Diphtheria, 3 cases, no deaths; scarlet fever, 1 case, no death; typhoid fever, 3 cases, no death; whooping cough, 1 case, no death.

What was done to prevent their spread? The houses were placarded, and no person allowed to visit the sick rooms.

SYLVANIA—DR. T. TAYLOR COSGROVE, H. O.

Nuisances abated. Throwing slops in street, 1; refusing to clean hog pens, 1; privy-vaults ordered cleaned, 2; removing dead animals from public highway, 2.

What has been done to control the privy-vault nuisance? Nothing more than to request them to clean them. People generally comply.

Hog pens within corporate limits? Probably 10 to 15.

Slaughter houses? One on the outskirts of town.

Dairies and milk supply inspected? One dairy. Milk supply private.

School-houses inspected? Yes.

Number of cases and deaths from infectious diseases: Whooping cough, 15 to 20 cases, no deaths.

TIFFIN—DR. J. BRIDINGER, H. O.

Improvements in sewerage. About eight miles of sewers built last year and about five miles more under way, and in about another year the whole city will be complete in mains and laterals.

Nuisances abated. Five private privies, union school privy, 1 case natural gas being burned in open stove, 6 private sewers, 1 cider mill and premises, natural gas regulator against public school building, 1 livery stable and 1 cellar; all were condemned by board as nuisances and removed.

What has been done to control the privy-vault nuisance? They are ordered to be cleaned, and where sewerage drained in and new vaults are built, are bricked and cemented.

Hog pens within corporate limits? Somewhere about 200.

Slaughter-houses? Six.

What was done to remove or control these? They are all inspected and examined once a week during the summer, and the rendering of tallow prohibited; think it only a question of short time until they will have to move out of city.

Dairies and milk supply inspected? Are frequently inspected.

School-houses inspected? Have all been inspected.

Number of cases and deaths from infectious diseases: Diphtheria, 60 cases, 16 deaths; scarlet fever, 14 cases, 4 deaths; typhoid fever, 1 case, 1 death.

What was done to prevent their spread? Cases were isolated and houses thoroughly fumigated and disinfected, and all houses placarded, all burials private and within twenty-four hours. Children also prohibited from going to school from infected houses.

Within the last year a milk and meat inspector has been appointed, whereby all milk dealers have to register; the milk and dairies are inspected; all meat markets, also canned goods and other produce. All the paved street gutters are flushed once a week by sanitary police; also all the sewers from hydrants. All dead animals are taken out of city and buried. The sanitary policeman is on duty all the time looking after privies and pig pens and alleys, also cellars, and wherever anything is found noisome the same is ordered removed. About one year ago the Board of Health passed stringent rules to have all infectious diseases reported within twenty-four hours. We now keep a record of births and of all deaths, and require burial permits, so that we may be able to prevent the spread of contagion.

TOLEDO—DR. G. A. COLLAMORE, H. O.

Improvements in sewerage. Several miles of new sewers constructed during year.

Nuisances abated. 8,370. Cleaning privies, removing dead animals, infected houses, filthy yards, filthy hog pens and stables, foul wells, defective drainage, etc.

What has been done to control the privy-vault nuisance? Effort has been made to induce and compel abutting lots to make sewer connections where possible.

Hog pens within corporate limits? No hogs allowed within circle, about one and one-half miles from center of city.

Slaughter-houses? One.

What was done to remove or control these? This stands at a distance from dwellings and is kept in sanitary condition by inspection.

Dairies and milk supply inspected? They are carefully inspected by milk inspector and city chemist.

School-houses inspected? Twice a year.

Number of cases and deaths from infectious diseases: Diphtheria, 564 cases, 175 deaths; scarlet fever, 141 cases, 5 deaths; typhoid fever, cases unknown, 33 deaths; measles, cases not reported, 8 deaths; whooping cough, cases unknown, 11 deaths.

What was done to prevent their spread? By concerted action with board of education no one of family is permitted to attend school. Isolation is secured as far as possible, houses are placarded and public funerals are ensured by the presence of one or more 'sanitary' police. Houses disinfected under direction of health officer.

UHRICHSVILLE—DR. J. E. GROVES, H. O.

Improvements in sewerage. A plat has been made for sewerage the entire town. The outlet for the system is being put down and several of the streets are ready to put in the sewers.

Nuisances abated. Thirty-three privy-vaults and pig pens.

What has been done to control the privy-vault nuisance? We have tried to keep them clean, and as fast as sewers are put in will endeavor to do away with them.

Hog pens within corporate limits? Several. Slaughter-houses? None.

Dairies and milk supply inspected? No.

School-houses inspected? Yes.

Number of cases and deaths from infectious diseases? Scarlet fever, 15 or 20 cases, no deaths; typhoid fever, 50 cases, 7 deaths.

UNION CITY—DR. WM. M. GRIMES, H. O.

Nuisances abated. Twenty-four privies, 3 manure piles and other filth, 1 filth deposited in alley, 5 lots ordered filled to prevent stagnant water; thirty-three nuisances abated during the year, not including 4 hog pen nuisances, one of which the owner refused to clean. I had him arrested, he plead guilty; was fined five dollars and costs. He then cleaned his pen and disinfected it in good order.

What has been done to control the privy-vault nuisance? I have ordered them cleaned and disinfected.

Hog pens within corporate limits? A great many more than there ought to be.

Slaughter-houses? Two outside of the corporation limits.

Dairies and milk supply inspected? No.

School-houses inspected? Yes, the Board of Health went on Nov. 7 and made an examination of the sanitary condition and found it good, except ventilation, which is bad. There is no way to ventilate only by hoisting or lowering the windows and either way lets a cold draught of air on the pupils and gives them cold, throat and lung diseases. The board suggested better ventilation.

UPPER SANDUSKY—DR. O. C. STUTZ, H. O.

Improvements in sewerage. One sewer built in the outskirts of the city.

Nuisances abated. Cleaning of hog pens and privy-vaults, removal of garbage and other filthy matter from streets and alleys. All dead animals buried, and all other nuisances in general are abated.

What has been done to control the privy-vault nuisance? All vaults are cleaned by rules and regulation of the Board.

Hog pens within corporate limits? Between two and three hundred.

Slaughter-houses? Three.

Dairies and milk supply inspected? Have inspected them several times this fall. The milk is up to the average standard.

Number of cases and deaths from infectious diseases: Diphtheria, 8 cases, 1 death; scarlet fever, 4 cases, no deaths; typhoid fever, 11 cases, 2 deaths.

What was done to prevent their spread? Notification is required from all physicians having the care of contagious diseases; houses are placarded for small-pox, scarlatina and diphtheria. The Superintendent of schools is notified of the existence of all contagious diseases and the children from all families where contagious diseases prevail are excluded from the schools. The Health Officer sees to the disinfection of all private houses. All those dying from diphtheria, scarlet fever and small-pox are required to be buried from 12 to 18 hours after death, or at least casket not opened after that time, and no public funeral permitted.

Special cause of ill-health. There are a great many privy-vaults connected with our sewers with little or no water to flush the same with; will be corrected as soon as possible. Hog pens, too, are causing more or less trouble.

URBANA—DR. H. C. HOUSTON, H. O.

Nuisances abated. One hundred and fifty-four privy-vaults; 67 other nuisances, including filthy barn-lots, cess pools, etc. In three instances houses were found so filthy that they were ordered cleaned.

What has been done to control the privy-vault nuisance? We have as yet placed no restriction on the manner of building vaults, but have had close attention given them by sanitary policemen and have freely used deodorizers.

Hog pens within corporate limits? 262, containing 1,098 hogs.

Slaughter-houses? Three on outskirts of city.

What was done to remove or control these? They have been frequently visited by health authorities and have been kept in as good sanitary condition as is possible.

Dairies and milk supply inspected? No.

School-houses inspected? Yes.

Number of cases and deaths from infectious diseases: Diphtheria, 3 cases, 3 deaths; scarlet fever, 59 cases, 5 deaths; typhoid fever, 7 cases, 3 deaths; measles, 3 cases, no deaths; whooping cough, 46 cases, 1 death.

What was done to prevent their spread? Houses placarded, and in malignant cases of diphtheria, houses quarantined. After recovery, fumigation has been required.

Since the introduction of Holly system of water supply, typhoid fever has been of rare occurrence, and in the seven cases reported, three contracted disease elsewhere. Other cases were in families using wells.

UTICA—DR. G. W. GARRISON, H. O.

Nuisances abated. Removed one tree; an Oleanthus. It gave off such a stench mornings and after rains that made all the people

enter a complaint to me and I had it cut down. All such trees growing in cities and towns should be cut down.

What has been done to control the privy-vault nuisance? I have enjoined disinfection; nothing more.

Hog pens within corporate limits? About fifty.

Slaughter-houses? None.

What was done to remove or control these? I have ordered all pens to be kept clean, and use unslacked lime in them once a week in summer and early fall season.

School-houses inspected? Yes.

Number of cases and deaths from infectious diseases: Diphtheria, 20 cases, 3 deaths; scarlet fever, 2 cases, 1 death; typhoid fever, 10 cases, no deaths; whooping cough, 20 cases, no deaths.

What was done to prevent their spread? Quarantine; fumigated the apartment with burning sulphur.

VERSAILLES—DR. WM. H. RIKE, H. O.

Improvements in sewerage. Stone sewer, 750 feet in length, to carry away waste water.

Nuisances abated. Thirty; six privy-vaults; the rest manure from hog pens and stables.

What has been done to control the privy-vault nuisance? Cleaned annually, and at such other times as ordered by Board of Health.

Hog pens within corporate limits? One hundred and two.

Slaughter houses? None.

What was done to remove or control these? An ordinance of the village forbids them.

Dairies and milk supply inspected? Yes.

School-houses inspected? Yes.

Number of cases and deaths from infectious diseases: Scarlet fever, 5 cases, no deaths; typhoid fever, 6 cases, no deaths; measles, about 50 cases, no deaths; whooping cough, about 20 cases, 2 deaths.

What was done to prevent their spread? Isolation of patients as far as possible; placarding the house in scarlet fever cases.

WADSWORTH—T. W. SCREENE, H. O.

Improvements in sewerage. A sewer of two foot pipe through main street.

Nuisances abated. Ten in number. Hogs removed from pens; all filth in mud and water; had the privies cleaned out and renovated; the alleys cleaned up back of groceries, which were covered with decayed matter; one cistern filled up; cellars cleaned out.

What has been done to control the privy-vault nuisance? Very little; the privies of our town are very bad; in fact, it is the hardest to deal with of any nuisance we have; we are trying to have new ones built and set upon pillars, with a box under same.

Hog pens within corporate limits? Thirty-eight.

Slaughter-houses? Three.

What was done to remove or control these? Nothing has been done to remove them; they are near corporate limits, on the north and west side.

Dairies and milk supply inspected? They were not, but the milk furnished is good.

School-houses inspected? I have; three new furnaces have been put in building this summer; the school is well ventilated.

Number of cases and deaths from infectious diseases: Scarlet fever, 3 cases, no deaths; typhoid fever, 3 cases, no deaths.

WASHINGTON C. H.—J. M. EDWARDS, H. O.

Improvements in sewerage. One-half mile 24-inch vitrified tile; $\frac{1}{2}$ mile 12-inch vitrified tile; 2 mile curb gutter stone.

Nuisances abated. Twenty privies, 16 hog pens, 15 alleys cleaned of manure, etc.; many small nuisances in back yards.

What has been done to control the privy-vault nuisance? Many are building water-proof walls, and we try to keep all vaults fairly cleaned.

Hog pens within corporate limits? Eight or ten in outskirts of city.

Slaughter-houses? Three.

What was done to remove or control these? Council passed an ordinance to abate them in the city; council now enjoined; case pending in Probate Court.

Dairies and milk supply inspected? No.

School-houses inspected? Yes; in good condition as to drainage and ventilation.

Number of cases and deaths from infectious diseases: Diphtheria, 3 cases, 1 death; scarlet fever, 9 cases, 1 death; typhoid fever, 2 cases, no deaths; measles, 90 cases, 2 deaths.

What was done to prevent their spread? Houses flagged; superintendent of schools notified; as far as possible houses quarantined.

WAVERLY—DR. AUSTIN HUTT.

(No Board of Health).

Nuisances abated. None.

What has been done to control the privy-vault nuisance? Nothing.

Hog pens within corporate limits? They have not been enumerated.

Slaughter-houses? Three.

What was done to remove or control these? In a manner, nothing.

Dairies and milk supply inspected? No.

School-houses inspected? Yes.

Number of cases and deaths from infectious diseases: All of the diseases mentioned in question 11, prevailed here; since I can not give facts I will not attempt guessing.

What was done to prevent their spread? Scarlet fever and diphtheria quarantined.

Special cause of ill-health. From the large amount of sickness within the last year one would suppose a special cause existed; nothing has been done to ascertain its character or remove it.

WHITE HOUSE—F. A. BUTLER, Mayor.

Nuisances abated. None.

What has been done to control the privy-vault nuisance? Nothing.

Hog pens within corporate limits? One hundred.

Slaughter-houses? None.

What was done to remove or control these? Nothing.

Dairies and milk supply inspected? No.

School-houses inspected? Yes.

WILLIAMSPORT—DR. G. C. HAYS, H. O.

Improvements in sewerage. Our village has no sewers, but is nicely drained with large tile.

Nuisances abated. We had very few, as last year's lesson has not been forgotten.

What has been done to control the privy-vault nuisance? There have been no new ones made, and the old ones have been cared for.

Hog pens within corporate limits? Perhaps half-dozen.

Slaughter-houses? None.

What was done to remove or control these? The board had them removed, and will not allow any new ones built.

Dairies and milk supply inspected? Yes.

School-houses inspected? Yes, and they are in better condition than ever before.

Number of cases and deaths from infectious diseases? Whooping cough, 7 cases, no deaths.

What was done to prevent their spread? They were quarantined by health officer.

WILMINGTON—DR. G. M. AUSTIN, H. O.

Improvements in sewerage. Their use has been restricted in all cases to the carrying off of flood and surface water.

Nuisances abated. One hundred and twenty-six, viz.: to remove hog pens from corporation, 18; to cleanse privies, 72; stagnant ponds and streams, 6; filthy wells, 4; filthy cellars, allers yards, etc., etc., 26.

What has been done to control the privy-vault nuisance? All private, prohibited. All public ones have been ordered to be changed to conform with Sec. 17 of our rules and regulations.

Hog pens within corporate limits? None.

Slaughter-houses? None inside corporation. Three outside.

What was done to remove or control these? They were ordered outside the corporation limits by the council several years ago. They are not allowed to locate on streams or in other places from which the offal might be carried by water into the town.

Dairies and milk supply inspected? Our dairymen are reliable farmers, and the quality of the milk they furnish is excellent.

School-houses inspected? Yes.

Number of cases and deaths from infectious diseases: Diphtheria, 5 cases, 1 death; typhoid fever, 6 cases, no deaths; measles, 50 cases, 4 deaths.

What was done to prevent their spread? Houses where contagious diseases have appeared have been placarded; the public have been rigidly excluded and the well members of the family have been excluded from the schools. Antiseptic measures are used in all cases.

Special cause of ill-health? A part of our town is flat and water soaked; in this district typhoid fever has been unusually prevalent. A thorough system of drainage is being carried out, which it is hoped will remove the trouble.

WILLSHIRE—DR. S. K. CHRISTY, H. O.

Nuisances abated: There has been no nuisance abated.

What has been done to control the privy-vault nuisance? Sanitary policeman has ordered all privies cleaned in April, and has cleaned privies for those who did not comply with orders.

Hog pens within corporate limits? About 30 or 40.

Slaughter-houses? None.

What was done to remove or control these? Nothing.

Dairies and milk supply inspected? No.

School-houses inspected? Yes.

Number of cases and deaths from infectious diseases: Typhoid fever, 7 cases, 1 death; measles, 8 cases, no deaths.

What was done to prevent their spread? Nothing.

Special cause of ill-health? Our watersupply is mostly from shallow, brick-walled wells. When the stone quarry at the river is pumped out the water in many of the wells is pumped out; when it fills the wells are filled. Tubular wells, put down deep in rock, would remove cause of typhoid fever.

WINCHESTER—DR. C. W. SALISBURY, H. O.

What has been done to control the privy-vault nuisance? Nothing.

Hog pens within corporate limits? Fifty.

Slaughter-houses? One.

What was done to remove or control these? Nothing.

Dairies and milk supply inspected? No.

School-houses inspected? Yes.

Number of cases and deaths from infectious diseases: Diphtheria, 5 cases, no deaths; typhoid fever, 12 cases, 2 deaths; measles, 6 cases, no deaths.

What was done to prevent their spread? Disinfection was practiced to a limited extent.

WELLSTON—DR. G. W. DARLING, H. O.

Nuisances abated. About 50. Ponds, cess-pools, hog pens, slaughter-houses and privy-vaults.

What has been done to control the privy-vault nuisance? We are changing, as fast as practicable, to the use of water-tight boxes and cemented vaults.

Hog pens within corporate limits? Perhaps 150.

Slaughter-houses? Two.

What was done to remove or control these? We have not done any thing toward having them removed. We have required them to be kept clean by having all refuse hauled to garbage ground.

Dairies and milk supply inspected? We have no milk supply but from private families.

School houses inspected? As a board, we have not.

Special cause of ill-health. The two great causes, I think, are the privy-vaults and the slops that are thrown into the streets and alleys. Privy-vaults are being changed; ordi-

nance to prevent any thing being thrown into streets or alleys.

WELLSVILLE—J. F. DAVIDSON, H. O.

Improvements in sewerage. None, except to drain the fair ground and street adjoining of surface water.

Nuisances abated. None.

What has been done to control the privy-vault nuisance? An ordinance by council requiring a depth of 15 feet, and not to be filled nearer the surface than four feet; but seldom enforced.

Hog pens within corporate limits? As near as I can ascertain, 15.

Slaughter-houses? One.

What was done to remove or control these? Nothing.

Dairies and milk supply inspected? No.

School-houses inspected? Yes, and find it in excellent condition.

Number of cases and deaths from infectious diseases: Diphtheria, 5 cases, 1 death; typhoid fever, 7 cases, 3 deaths.

What was done to prevent their spread?

Nothing. The rules and regulations of the Board of Health are good and sufficient, but the board appears to be afraid of offending by a strict enforcement of them.

Special cause of ill-health. There are a few causes, but as the effects are scarcely noticeable there has been but little done to remove them. They are hog pens, swampy land, bad smelling privies, and we have a gas works where water gas is manufactured.

WEST ALEXANDRIA—L. J. ASHWORTH, H. O.

Improvements in sewerage. Some little done, but not much needed in our small town.

Nuisances abated. Dead rats, cats, chickens, pigs, etc., some privies and numerous hog pens, drains in alleys and low places in gutters. Removed fertilizer from the corporate limits which was stored and car loads from the track.

What has been done to control the privy-vault nuisance? But little, except to have a few cleaned where complaint was laid in.

Hog pens within corporate limits? About forty.

Slaughter-houses? One.

What was done to remove or control these? No effort to remove them, but the slaughter-house was required to be kept clean, and the hog pens where complaint was laid in.

Dairies and milk supply inspected? We have but one and no inspection has been made.

School-houses inspected? I have, and find them in good condition with the exception of the boys' privy which is treated very badly by them, but kept as clean as practicable under the circumstances.

Number of cases and deaths from infectious diseases: Measles, about 50 cases, no deaths.

What was done to prevent their spread? They were not allowed to attend the public schools.

Special cause of ill-health. I think if there is any one cause that is worse than any other it is the privy-vaults; but little has been done to change it.

WEST JEFFERSON—DR. W. E. POSTLE, H. O.

Improvements in sewerage. Cleaning out of the old drains and water-ways.

Nuisances abated. Hog pens, privy-vaults, manure piles, filthy cattle cars, scraps and refuse of butcher shops.

What has been done to control the privy-vault nuisance? Disinfection when it would answer, and properly constructed new vaults when it would not.

Hog pens within corporate limits? Indeterminate, as they are allowed in cold weather, if not too filthy.

Slaughter-houses? None.

What was done to remove or control these? None to remove or control.

Dairies and milk supply inspected? Yes; in good condition.

School houses inspected? Yes; in good order.

Number of cases and deaths from infectious diseases: Diphtheria, 13 cases, 2 deaths; scarlet fever, 1 case, no death; typhoid fever, 1 case, no death.

What was done to prevent their spread?

Notices kept up during sickness, and disinfection afterward.

WEST MENTOR—DR. JOHN W. LOWE, H. O.

Improvements in sewerage. No sewerage system. The living streams through town are kept free from vegetable accumulation and all filth removed as often as necessary.

Nuisances abated. Two dead horses ordered buried, one cess pool filled, one manure pile ordered removed and dog nuisances abated.

What has been done to control the privy-vault nuisance? We have none requiring the attention of the Board of Health.

Hog pens within corporate limits? About seventy-five.

Slaughter-houses? One.

What was done to remove or control these? Nothing done to remove them, but if the condition of any of them require attention, the Health Officer pays them a personal visit.

Dairies and milk supply inspected? Yes.

School-houses inspected? Yes.

Number of cases and deaths from infectious diseases: Typhoid fever, 2 cases, 1 death; whooping cough, 2 cases, no deaths.

What was done to prevent their spread? Administered antiseptic treatment.

Special cause of ill health. The Lake Shore R. R. supplies water for drinking purposes at Mentor Station, which is taken indirectly from a swampy place full of decayed vegetable matter, and ducks and cattle are allowed to run there. I wrote to the Lake Shore officials and they promised to sink a well and provide good water, but have not done so yet.

WEST SALEM—DR. B. M. McCAULEY, H. O.

Nuisances abated. About forty, consisting of privy-vaults, hog pens, manure piles and stagnant water.

What has been done to control the privy-vault nuisance? All new privies are built with drawers; old ones retain vaults.

Hog pens within corporate limits? Fifty.
Slaughter-houses? None.

Dairies and milk supply inspected? No.

School-houses inspected? Yes—sanitary condition fair.

Number of cases and deaths from infectious diseases: Typhoid fever, 1 case, no death.

WESTERVILLE—JNO. W. OYLER, H. O.

Nuisances abated. Fifty privy-vaults and 6 hog pens.

What has been done to control the privy-vault nuisance? Resolution adopted preventing the construction of new vaults.

Hog pens within corporate limits? Fifteen.
Slaughter-houses? One.

What was done to remove or control these?

A petition to remove is now before the Board of Health.

Dairies and milk supply inspected? No.

There is but one dairy and that upon a farm.

School-houses inspected? Yes, condition is good.

WOODSFIELD—DR. W. J. GRIMES, H. O.

Nuisances abated. Not very many. The notices in many instances were disregarded.

What has been done to control the privy-vault nuisance? Very little.

Hog pens within corporate limits? Do not know. Very numerous and majority in bad condition.

Slaughter-houses? Three.

What was done to remove or control these? Nothing.

Dairies and milk supply inspected? Have no dairies.

School-houses inspected? No.

Number of cases and deaths from infectious diseases: Diphtheria, 8 cases, no deaths; scarlet fever, 10 cases, no deaths; typhoid fever, 10 cases, 1 death; measles, 5 cases, no deaths; whooping cough, 30 cases, no deaths.

What was done to prevent their spread?

Very little. The attending physicians did not report the cases as they should have done.

XENIA—DR. A. D. DE HAVEN, H. O.

Improvements in sewerage. There has been no improvement in that line to speak of; sewerage system is *very poor*.

Nuisances abated. We issued about 200 orders for the abatement of nuisances, which consisted in the removal of contents of privy-vaults, garbage, cleaning of hog pens, digging sinks, etc.

What has been done to control the privy-vault nuisance? All new ones to be constructed according to specifications, i. e., 10 feet deep and walled with brick or stone and cemented.

Hog pens within corporate limits? About 30.

Slaughter-houses? Three, almost on the corporation line.

What was done to remove or control these? All hog pens are kept free from filth and thoroughly disinfected. Any one not complying with this order must remove hogs outside of corporate limits; slaughter-houses are in good condition at present.

Dairies and milk supply inspected? No.

School-houses inspected? No; one of our members of the Board of Health is also member of the school board.

Number of cases and deaths from infectious diseases: Diphtheria, 80 cases, 2 deaths; scarlet fever, 20 cases, no deaths; typhoid fever, 10 cases, no deaths; measles, quite a number.

What was done to prevent their spread?

The houses were posted in cases of diphtheria and scarlet fever, and scarlet fever patients kept from school 6 weeks; diphtheria patients 2 and 3 weeks—also all children from those families were kept out the same length of time.

YOUNGSTOWN—DR. W. L. BUECHNER, H. O.

Improvements in sewerage. We have $11\frac{1}{2}$ miles of sewers; $2\frac{1}{4}$ miles were built during the last year. Our sewer system is defective in many respects. In many places the capacity is too small to carry off the surface water after a heavy rain. In other places the sewers are so superficial that the abutting property can not be drained into them.

Nuisances abated. There were 689 privy-vaults cleaned and renovated; 1,200 premises were cleaned of rubbish, garbage, slops and other offensive matter.

What has been done to control the privy-vault nuisance? 205 permits were granted to construct new ones: must be built of stone or brick and cemented; all other kinds are condemned and removed.

Hog pens within corporate limits? About twenty-five. Ordinance provides that they must be at least 101 feet from the nearest dwelling-house.

Slaughter-houses? None. We have an ordinance forbidding slaughtering within the city limits.

Dairies and milk supply inspected? Yes: our milk is pretty good. We make frequent examinations of the same.

School-houses inspected? Yes; some are deficient in ventilation and light, but most of them are in good sanitary condition.

Number of cases and deaths from infectious diseases: Diphtheria, 44 cases, 5 deaths; scarlet fever, 102 cases, 8 deaths; typhoid fever, 65 cases, 15 deaths; measles, 41 cases, no deaths; whooping cough, 3 cases, 1 death.

What was done to prevent their spread?

The State and local laws bearing upon this subject were strictly enforced. I am not able to report the cases of whooping-cough correctly, as only attending physicians have to report their cases, and in many cases no physician is employed.

ZANESVILLE—DR. H. T. SUTTON, H. O.

Improvements in sewerage. The improvements in sewerage have been very extensive in the past year, but our board can not claim credit for but a small portion of it. The Board has caused the sewer to be tapped in about 20 cases.

Nuisances abated. Have filled low lots to the extent of \$1,500 worth. Have had 500 privy-vaults cleaned, 65 hog pens cleaned, 40 dead animals removed, 200 manure piles removed and 150 ash piles; run 2 two-horse garbage carts

every day during the months of May, June, July, August and September, at an expense of \$5.50 per day. Had 275 yards cleaned, 126 cellars cleaned. Have had nearly all the streets, alleys and gutters in the city cleaned at some time during the year. The filling spoken of above was done by the Board itself and all was paid for before going on the tax duplicate but one. It was all for private parties except about \$150 which was for the city.

What has been done to control the privy-vault nuisance? We require every person building or removing a privy vault to first obtain a permit from the Board of Health as to how it should be built and where located.

Hog pens within corporate limits? About 500. We have passed a law which will go into effect March 1, 1891, putting the hogs out of the city.

Slaughter-houses? None to my knowledge. The Board had two abandoned about a year ago.

What was done to remove or control these? We first made an effort to have them kept clean; failing in that we served notice to close them.

Dairies and milk supply inspected? The dairies have all been visited by our sanitary policeman, and most of their milk tested.

School-houses inspected? No.

Number of cases and deaths from infectious diseases: Diphtheria, 55 cases, 24 deaths; scarlet fever, 39 cases, 1 death.

What was done to prevent their spread? The physicians are required to report all cases of scarlet fever and diphtheria at once, and immediately the houses are placarded.

Special cause of ill health. The attention of the Board was called to our water supply from one of our power houses. We at once made an investigation and found that we were getting some sewerage in all probability. We immediately issued an order to close it, which order was obeyed promptly.

ABSTRACT OF REPORTS

—OF—

DEATHS AND THEIR CAUSES

IN THE FOLLOWING

CITIES AND TOWNS IN OHIO,

FOR THE YEAR ENDING OCTOBER 31, 1890.

ABSTRACT OF REPORTS OF DEATHS AND CAUSES, IN THE FOLLOWING

Place and population (estimated).	Total deaths, all causes.*	Annual rate per 1,000.*	Total under five years.	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis.	Diarrhoea.	Dysentery.	Measles.	Scarlet fever.	Typhoid fever.	Whooping cough.
Akron, 30,000.....	25	10.00		14	10								
Alliance, 10,000.....	16	19.20	4	6	3								
Ashley, 800.....	3	45.00		3	3								
Ashtabula, 6,500.....	9	16.92	4	2	1							1	
Bedford, 1,000.....	3	36.00		1									
Bellaire, 12,000.....	8	8.00	5										
Bellevue, 3,500.....	2	6.86	1										
Bloomington, 800.....	2	30.00											
Canton, 25,000.....	17	8.16		1				1					
Cincinnati, 325,000.....	456	16.83	142	103	49	1	5	8	4	1	4	12	4
Cleveland, 235,000.....	423	21.60	130	136	62	3	2	4		12	6	14	7
Chillicothe, 14,000.....	14	12.00	7	5	2						1	1	
Clyde, 3,000.....	5	20.00		1									
Columbus, 101,000.....	86	12.17	21	21	9	3	3					5	
Conneaut, 1,500.....	6	11.67	3	2		1	1				1	1	
Cuyahoga Falls, 3,500.....	3	10.28											
Dayton, 60,000.....	65	13.00	18	15	12							2	
Defiance, 7,000.....	9	15.43	4	1								1	
Delaware, 9,000.....	6	8.00	1	2	2								
Delphos, 5,000.....	6	14.40	3	1					1			1	
East Liverpool, 10,000.....	9	10.80		1									
Fostoria, 8,000.....	6	9.00	5	1	1						1	8	
Hamilton, 20,000.....	13	7.80	2	2	2								
Higginsport, 1,000.....	4	24.00	1	2	2								
Hudson, 1,800.....	2	26.66											
Kent, 4,000.....	2	6.00											
Lancaster, 8,000.....	21	31.50		18	13								
McComb, 1,400.....	2	17.14		1	1								
Mansfield, 15,000.....	14	11.20	2	3	2							1	
Marion, 8,000.....	4	6.00		1			1						
Miamisburg, 3,500.....	2	4.85											
Middletown, 8,200.....	6	11.71		4	1				1			1	1
Milford, 1,500.....	3	24.00											
Nelsonville, 5,000.....	3	7.20	3										
New Straitsville, 3,000.....	2	8.00		2			1						
North Amherst, 1,600.....	4	30.00		1	1								
Oberlin, 4,000.....	6	18.00	1	2									
Painesville, 5,000.....	5	12.00											
Piqua, 10,000.....	8	9.00	3	3	1							1	
Portsmouth, 14,000.....	9	8.81	3	1				1					
Richwood, 2,000.....	2	12.00											
St. Bernard, 1,300.....	3	27.69	2	2	1							1	
Salem, 6,000.....	8	16.00	2	1								1	
Shawnee, 3,000.....	4	16.00	1										
Shelby, 2,500.....	3	14.40		1									
Springfield, 38,000.....	14	4.42	4	1									
Toledo, 89,000.....	126	16.98	53	43	36			2			1	1	1
Urbana, 8,000.....	8	12.00	3	1		1							
Wadsworth, 2,500.....	3	14.40		1		1							
Warren, 8,000.....	6	9.00	1										
Washington C. H., 7,500.....	6	9.60	3	2							1		
Waverly, 1,600.....	6	45.00											
West Cleveland, ———.....	3												
West Salem, 900.....	2	26.66		2									
Wooster, 8,500.....	6	8.47	2	2	2								
Xenia, 10,000.....	7	8.40		3									
Youngstown, 25,000.....	23	11.04	7	6	3							2	
Zanesville, 25,000.....	29	13.92	11	7	1				1			2	
Totals: population, 1,258,450...	1,565	14.93	452	435	226	10	15	16	7	13	14	53	13

Carthage reports 1 death from old age; Felicity 1 death, cause not given; Forest 1 death, from puerperal fever; Galion 5 deaths; Logan 1 death from bronchitis; Mt. Gilead 1 death from pneumonia; New Bremen 1 death from consumption; New Holland 1 death from apoplexia; New

* Premature and still births excluded.

CITIES AND TOWNS OF OHIO, DURING THE MONTH OF NOVEMBER, 1889.

Total constitutional diseases.	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexy.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Measles.	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still-born.	Antho y.
4	1	3	7	1						1		2			6	Dr. L. S. Ebright, H. O.
2		2	7	3					2			2	1	1	1	Dr. James Bates, H. O.
																J. Harroun, H. O.
1		1	4						1			3	2			Dr. A. W. Hopkins, H. O.
2																A. C. Critchlow, H. O.
1		1	7	1			1		1	1		2				Dr. J. Park West, H. O.
									1				1			John Earls, H. O.
1		1	1	1												L. Dillinger, H. O.
7		4	8	1			4		1			1				Dr. J. F. Marchand, H. O.
82	13	48	227	7	7	18	12	9	35	12	1	38	26	18	48	Dr. Byron Stanton, H. O.
62	9	27	188	7	2	17	42	11	20	15	1	31	20	17	71	Dr. G. C. Ashmun, H. O.
3	1	2	5				1		1			1		1	2	Dr. J. D. Miller, H. O.
									2			1				Alex. Harnden, H. O.
18	1	16	30	1	1	3	4	2	9	1		6	7	5	6	Dr. F. Gunsaulus, H. O.
				1									2			Dr. E. D. Merriam, H. O.
1	1		1						1				1			Dr. W. S. Hough, H. O.
18	2	9	24				2	1	4	3		4	4	4	2	Dr. J. M. Weaver, H. O.
4	1	3	3			1	1		1				1		1	Dr. D. P. Aldrich, H. O.
			4									1				Dr. J. W. N. Vogt, H. O.
			3				2					1	3	1		C. P. Washburn, H. O.
1		1	3									3				Wm. Gibbs, H. O.
3		3	2	1					1				1	1		J. O. Hess, H. O.
																Dr. George Trebel, H. O.
1	1		1									1	1	1		Philip J. Daum, H. O.
1		1	1						1							Dr. F. Dodge, H. O.
1		1											1	1		J. P. Holcomb, H. O.
3		3	6					1								Dr. J. W. Lewis, H. O.
1		1	2						1			1			3	Dr. Jno. A. Thompson, H. O.
2																Dr. R. Harvey Reed, H. O.
3	1	2										1				J. K. Redd, H. O.
3	1	2								2					1	Dr. W. S. Bookwalter, H. O.
2		2	1	1									1			Dr. John T. Sutphen, H. O.
		2	1	1												Dr. Otto Palm, -en, H. O.
			1									1		2		Dr. Chas. W. Cable, H. O.
3		3														E. G. Spurrier, H. O.
1		1	3									1				Dr. N. H. Cornwell, H. O.
2	1	1	3							2						Thomas R. Mayhew, H. O.
2		2	3					1				1				H. P. Sanford, H. O.
3		3	4		1	1			2						1	Dr. R. M. O'Ferrall, H. O.
			1										1			Dr. C. C. Fulton, H. O.
													1			Dr. J. Oatley, H. O.
1		1	4				1					3	1	1		S. D. Spence.
			3											1		Dr. T. T. Church, H. O.
3	1	2	8	1	2		1					2	2		2	C. E. Whittington, Clerk.
11	2	8	56	2	1	5	10	5	5			6	7	9	8	Dr. M. T. Love, H. O.
			4							2			2	1		Dr. H. H. Seys, H. O.
			1							1			1			Dr. G. C. Collamore, H. O.
1		1	3	1						2			1	1		Dr. H. C. Houston, H. O.
2		2	2				1		1						2	H. H. Bricker, H. O.
3	1	1	2						1	1						Dr. S. H. Smith, H. O.
			1			1							2			J. M. Edwards, H. O.
1	1		1						1						1	Dr. Austin Butt, H. O.
			1										1	1	2	G. L. Brooks, Clerk.
2		2	2									1	1			Dr. B. M. McCauly.
4		2	10			1	1	1		1		5	1	2		Dr. J. E. Barrett, H. O.
8		8	12		2				2			1	1	1	4	Dr. A. S. Dryden, H. O.
275	40	172	646	301	16	48	83	31	105	40	2	120	101	69	162	Dr. W. L. Buechner, H. O.
																Dr. H. T. Sutton, H. O.

London 1 death from heart disease; West Unity 1 death from erysipelas. The following places report no deaths from November: Belle Center, Garrettsville, Linwood, Lima, Mechanicsburg, St. Paris and Union City.

ABSTRACT OF REPORTS OF DEATHS AND CAUSES, IN THE FOLLOWING

Place and population. (estimated.)	Total deaths, all causes.*	Annual rate per 1,000.*	Total under five years.	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis.	Diarrhoea.	Dysentery.	Measles.	Scarlet fever.	Typhoid fever.	Whooping cough.
Akron, 80,000.....	34	13.60	14	14	2							1	
Alliance, 10,000.....	16	19.20	4	4	3							1	
Ashtabula, 6,500.....	12	22.15	5	1	1								
Bainbridge, 800.....	3	45.00	1	1									
Bellaire, 12,000.....	17	17.00	7	2								2	
Bellevue, 3,500.....	3	10.28	1	1	1								
Canton, 25,000.....	22	15.60	7	1								1	
Cincinnati, 325,000.....	469	17.59	143	85	41		4	4	2	3		9	5
Chillicothe, 14,000.....	16	13.71	3	3									
Cleveland, 235,000.....	387	19.86	135	115	39		2	6	17	4	20	1	9
Columbus, 101,000.....	111	13.16	35	21	10		2			2			
Conneaut, 1,500.....	7	56.00	1	1			1						
Cuyahoga Falls, 3,500.....	4	13.71											
Dayton, 60,000.....	49	9.80	12	13	10		1						
Defiance, 7,000.....	8	13.71	2	4								1	
Delaware, 9,000.....	8	6.68	3	2	2								
Delphos, 5,000.....	7	16.80	2	2	1							1	
East Liverpool, 10,000.....	12	14.40	3	4								3	
Fostoria, 8,000.....	12	18.00	2	7	3						1	3	
Galion, 7,000.....	7	12.00	2	3			1						
Hamilton, 20,000.....	22	12.00	9	4	3								
Lancaster, 8,000.....	6	9.00	2	1					1				
Lebanon, 3,000.....	7	28.00		1				1					
Logan, 3,700.....	2	6.48											
Mansfield, 15,000.....	9	7.20	4										
Marion, 8,000.....	10	15.00	1	3							2	1	
Miamisburg, 3,500.....	3	10.28											
Middletown, 8,200.....	9	13.17	3										
Nelsonville, 5,000.....	5	12.00	1	3									1
New Straitsville, 3,000.....	4	16.00	2	2							2		
North Amherst, 1,600.....	3	22.50											
Oberlin, 4,000.....	5	15.03		1									
Orrville, 2,000.....	3	18.00	1										
Painesville, 5,000.....	4	9.60											
Piqua, 10,000.....	8	9.60	2	1								1	
Portsmouth, 14,000.....	11	8.43	2										
Ravenna, 7,500.....	4	6.40											
Salem, 6,000.....	4	8.00											
St. Bernard, 1,300.....	6	55.38	2	4	2							1	
Springfield, 38,000.....	24	7.57	9	3	1		1					1	
Tiffin, 14,000.....	8	6.86		8							8		
Toledo, 89,000.....	96	12.94	28	30	23		1					3	
Urbana, 8,000.....	8	12.00											
Utica, 1,000.....	3	36.00		3	2							1	
Wadsworth, 2,500.....	3	14.40		2			1					1	
Washington C. H., 7,500.....	6	9.60	3	2	1								
West Cleveland, —.....	3			1							1		
Wooster, 8,500.....	6	8.47	3										
Xenia, 10,000.....	7	8.00		1	1								
Youngstown, 25,000.....	34	16.32	11	7	4						1	1	
Zanesville, 25,000.....	31	14.88	5	13	7				1			3	
Totals: population, 1,307,700.....	1,500	13.61	470	380	157	4	12	11	4	20	22	55	16

Clyde reports 1 death from heart disease and 1 from bronchitis; Crestline, 1 death from heart disease and 1 from typhoid fever; Garrettsville, 1 death from angina pectoris and 1 from uræmic embolism; Hudson, 1 death from heart disease and 1 from old age; Kent, 1 death from heart disease and 1 from spinal bifida; McComb, 1 death from Bright's disease and 1 cause not stated; Mt. Gilead, 1 death from apoplexia and 1 from old age; Rocky Ridge, 1 death from convulsions and 1 from violence; St. Paris, 1 death from gastritis and 1 from inanition; Shawnee, 1 death from scarlet fever and 1 from convulsions; South Charleston, 1 death from pneumonia and 1 from cerebro meningitis; Versailles, 1 death from purpura and 1 from phthisis pulmonalis; Warren, 1 death from syphilis and 1 from phthisis pulmonalis; West Salem, 1 death from cholera infantum and 1 from phthisis pul-

* Premature and still births not included.

CITIES AND TOWNS OF OHIO, DURING THE MONTH OF DECEMBER, 1889.

Total constitutional diseases.	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still born.	Authority.
1	1	14					3		2			2	2	3	3	Dr. L. S. Ebricht, H. O.
3	3	7					1	1				2	2	1	1	Dr. James Bates, H. O.
1	1	7					1		1			3	2			Dr. A. W. Hopkins, H. O.
4	1	2								1		4	3			Dr. L. F. House, H. O.
4	1	1										1			1	Dr. I. Park West, H. O.
82	10	60	251				3	1	3	1		50	34	17	50	John Ear's, H. O.
2	1	1	9					1	1			2	1			Dr. J. F. Marchand, H. O.
59	10	38	173				8	37	18	8		41	25	15	61	Dr. Byron Stanton, H. O.
23	3	19	48				36	7	21	12		11	11	6	4	Dr. J. D. Miller, H. O.
1		1	4				7	5	6	3		2	1			Dr. G. C. Ashmun, H. O.
		2	1				1					1	1			Dr. F. Gunsaulus, H. O.
11	10	20	1				3	2	3	1		5	4		5	Dr. E. D. Merriam, H. O.
1		3										1	1			Dr. W. S. Hough, H. O.
		3										1	1			Dr. J. M. Weaver, H. O.
2	2	3					1					4	2		1	Dr. D. P. Aldrich, H. O.
3	3	10						1	2	5		2	3		1	Dr. J. W. N. Vogt, H. O.
3	1	2	1				1					1	2			C. P. Washburn, H. O.
2	1	1	4									1	2			Wm. Gibbs, H. O.
		6										2				J. O. Hess, H. O.
2	2	3										2				Dr. Webb J. Kelly, H. O.
3	3	10						1	2			3	1			Dr. Geo. Trebel, H. O.
3	1	2	1				1					2				Dr. J. W. Lewis, H. O.
2	1	1	4				1					2				Dr. J. B. Graham, Sec'y.
		6					1		1			1	2		1	Dr. I. C. Wright, H. O.
2	1	1	7						1			2	1			Dr. R. Harvey Feed, H. O.
1	1	1	1									1	1			J. K. Ridd, H. O.
1	1	1	1						1			2	1			Dr. W. S. Bookwalter, H. O.
2	2	1										1	1			Dr. John T. Sutphen, H. O.
2	2	2										1	1			Dr. Chas. W. Cable, H. O.
2	2	2										1	1			E. spurrier, H. O.
2	1	1										1	1			Dr. W. H. Cornwell, H. O.
3	1	3	1				1					1	1			Thos. R. Mayhew, H. O.
4	4	5										1	2		2	Dr. S. E. Grill, H. O.
1	1	2										1	1			S. D. Barber, H. O.
		3	1									1	1			Dr. R. M. O'Ferrall, H. O.
		3	1									1	2		2	Dr. C. C. Fulton, H. O.
		3	1									1	1			I. R. Mason, H. O.
		3	1									1	1			Dr. T. T. Church, H. O.
		3	1									1	1			Dr. S. D. Spence, H. O.
		3	1									1	1			Dr. H. H. Seys, H. O.
		3	1									1	1			Dr. J. Bridinger, H. O.
		3	1									1	1			Dr. G. A. Coommore, H. O.
		3	1									1	1			Dr. H. C. Houston, H. O.
		3	1									1	1			Dr. G. W. Garrison, H. O.
		3	1									1	1			H. H. Bricker, H. O.
		3	1									1	1			J. M. Edwards, H. O.
		3	1									1	1			G. T. Brook, H. O.
		3	1									1	1			Dr. J. M. Barrett, H. O.
		3	1									1	1			Dr. A. L. Dyden, H. O.
		3	1									1	1			Dr. W. L. Buchler, H. O.
		3	1									1	1			Dr. H. T. Sutton, H. O.
259	33	189	650	36	35	63	84	35	107	44	1	158	136	68	153	

monalis; Carthage, 1 death from typhoid fever; Bedford, 1 death from delirium tremens; Bloomingburg, 1 death from old age; Mechanicsburg, 1 death from phthisis pulmonalis; Milford, 1 death from malarial fever; New London, 1 death from phthisis pulmonalis; Pemberville, 1 death from dropsy; Plymouth, 1 death from old age; Richwood, 1 death from violence; Shelby, 1 death from phthisis pulmonalis; Union City, 1 death from pneumonia; West Unity, 1 death from pneumonia; West Liberty, 1 death from ovarian fibroid. The following places report no deaths during the month of December: Ashley, Felicity, Forest, Higginsport, Linwood, New Bremen, New Holland, Pioneer, Springboro, Waverly and West Milton.

ABSTRACT OF REPORTS OF DEATHS AND CAUSES, IN THE FOLLOWING

Place and population (estimated).	Total deaths, all causes.*	Annual rate per 1,000.*	Total under five years.	Total zymotic diseases.	Group and diphtheria.	Cholera infantum.	Cerebro-spinal men'g'i's.	Diarrhoea.	Dysentery.	Measles.	Scarlet fever.	Typhoid fever.	Whooping cough.
Akron, 30,000.....	35	14.00	7	10	1	.....	.....	.....	.....	.....	1	.....	2
Alliance, 10,000.....	11	13.20	1	2	1	.....	.....	.....	.....	.....	.....	.....	.....
Ashtabula, 6,500.....	13	22.15	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bellaire, 12,000.....	12	12.00	4	5	.....	.....	.....	.....	.....	.....	.....	2	2
Bellevue, 3,500.....	5	18.57	.....	2	.....	.....	.....	.....	2	.....	.....	.....	.....
Bloomingsburg, 800.....	4	60.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Canton, 25,000.....	38	18.24	10	4	1	.....	.....	.....	.....	.....	1	.....	.....
Cincinnati, 325,000.....	669	21.62	235	121	39	1	4	3	3	3	3	18	11
Chillicothe, 14,000.....	18	15.43	.....	7	.....	.....	.....	.....	.....	.....	.....	.....	2
Cleveland, 235,000.....	510	26.05	313	115	33	1	1	4	.....	17	9	17	12
Clyde, 3,000.....	6	24.00	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Columbus, 161,000.....	105	12.42	26	6	2	.....	.....	.....	.....	.....	1	2	.....
Conneaut, 1,500.....	3	24.00	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Crestline, 3,300.....	7	25.42	2	2	.....	.....	.....	.....	.....	.....	.....	.....	.....
Dayton, 60,000.....	108	21.60	33	12	7	.....	.....	.....	.....	3	.....	.....	.....
Defiance, 7,000.....	5	8.57	2	1	.....	.....	1	.....	.....	.....	.....	.....	.....
Delaware, 9,000.....	5	6.60	.....	2	1	.....	.....	.....	.....	.....	1	.....	.....
Delphos, 5,000.....	3	7.20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Dunkirk, 1,800.....	10	66.66	3	4	2	.....	1	.....	.....	.....	.....	.....	.....
East Liverpool, 10,000.....	21	36.20	4	6	2	.....	.....	1	.....	.....	.....	3	.....
Felicity, 1,000.....	3	36.00	1	2	.....	.....	.....	.....	.....	.....	.....	.....	.....
Fostoria, 8,000.....	6	9.00	.....	2	1	.....	.....	.....	.....	.....	.....	.....	.....
Galion, 7,000.....	9	15.43	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hamilton, 20,000.....	41	11.10	17	15	7	.....	1	.....	.....	.....	1	2	.....
Hudson, 1,800.....	3	20.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Jackson, 5,500.....	5	8.73	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Kent, 4,000.....	4	12.00	1	1	1	.....	.....	.....	.....	.....	.....	.....	.....
Lancaster, 8,000.....	11	16.50	1	2	1	.....	.....	1	.....	.....	.....	.....	.....
Lewisburg, 800.....	3	45.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Logan, 3,700.....	3	9.73	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ludlow Grove, 1,300.....	8	73.85	.....	5	.....	.....	.....	.....	.....	1	.....	4	.....
Mansfield, 15,000.....	18	15.2	4	9	3	.....	.....	.....	.....	.....	.....	.....	1
Madison, 1,000.....	4	48.00	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Marion, 8,000.....	7	10.50	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Maumee, 2,000.....	3	18.00	1	1	1	.....	.....	.....	.....	.....	.....	.....	.....
Miamisburg, 3,500.....	7	24.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Middletown, 8,200.....	7	10.24	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	1
Milford, 1,500.....	3	24.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Nelsonville, 5,000.....	6	14.40	3	2	1	.....	.....	.....	.....	.....	.....	.....	.....
North Amherst, 1,600.....	3	22.50	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Oberlin, 4,000.....	9	27.00	2	2	.....	.....	.....	.....	.....	.....	1	.....	.....
Orrville, 2,000.....	3	18.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Painesville, 5,000.....	13	31.20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Piqua, 10,000.....	5	6.60	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Portsmouth, 14,000.....	16	13.71	5	1	.....	.....	.....	.....	.....	.....	1	.....	.....
Ravenna, 7,500.....	5	8.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Salem, 6,000.....	3	6.60	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Shawnee, 3,000.....	3	12.00	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
South Charleston, 1,200.....	4	40.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Springfield, 38,000.....	48	10.26	14	5	4	.....	.....	.....	.....	.....	.....	.....	.....
Toledo, 89,000.....	132	17.22	51	42	34	.....	.....	2	.....	.....	1	2	1
Uhrichsville, 4,300.....	4	11.16	.....	1	.....	.....	.....	.....	.....	.....	.....	1	.....
Union City, 1,300.....	3	26.15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Urbana, 8,000.....	10	15.00	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Versailles, 2,000.....	4	24.00	1	1	.....	.....	1	.....	.....	.....	.....	.....	.....
Wadsworth, 2,500.....	8	33.40	.....	2	.....	.....	.....	.....	.....	.....	.....	2	.....
Washington C. H., 7,500.....	7	11.20	2	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Warren, 8,000.....	4	6.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Waverly, 1,600.....	3	22.50	2	1	.....	.....	.....	.....	.....	1	.....	.....	.....
West Cleveland, ———	9	.....	1	3	.....	.....	.....	.....	.....	2	1	.....	.....
Wooster, 8,500.....	12	16.94	.....	3	.....	.....	.....	.....	.....	2	.....	1	.....
Xenia, 10,000.....	14	16.80	.....	2	.....	.....	.....	1	.....	.....	1	.....	.....
Youngstown, 25,000.....	45	21.60	8	8	2	.....	.....	1	.....	.....	.....	4	.....
Zanesville, 25,000.....	27	14.60	7	6	4	.....	.....	.....	.....	.....	1	.....	.....
Totals: population, 1,307,500.....	2,184	20.04	772	430	151	2	9	10	8	29	22	62	33

Bainbridge reports 1 death from phthisis pulmonalis; Canfield, 2 from diphtheria; Carthage, 1 from typhoid fever and 1 from heart disease; Clarington, 1 from whooping cough and 1 from pneumonia; Cuyahoga Falls, 1 from chronic bronchitis; Forest, 1 from typhoid fever and 1 from heart disease; Higginsport, 1 from hemorrhage and 1 from apoplexia; Lebanon, 1 from tumor and 1 from spasms; Miamisburg, 1 from pneumonia and 1 from apoplexia; Moscow, 1 from phthisis pulmonalis; Mt. Gilead, 1 from phthisis pulmonalis, and 1 from apoplexia; New Lon-

CITIES AND TOWNS OF OHIO, DURING THE MONTH OF JANUARY, 1890.

Total constitutional dis.	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developme'tal dis.	Total violence.	Premature and still-b'n.	Authority.
4	1	3	16	6	1	1	1	1	4	3	.....	4	3	2	3	Dr. L. S. Ebright, H. O.
3		3	4	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	Dr. James Bates, H. O.
2	1	1	8	.....	.....	2	1	.....	.....	4	.....	.....	.....	.....	.....	Dr. A. W. Hopkins, H. O.
1		1	5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	Dr. J. Park West, H. O.
.....			2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	John Earls, H. O.
.....																Dr. L. Dillinger, H. O.
5		5	22	.....	.....	.....	4	.....	.....	.....	.....	4	.....	.....	.....	Dr. J. F. Marchand, H. O.
142	9	99	342	13	7	49	21	11	26	17	.....	110	43	21	40	Dr. Byron Stanton, H. O.
3		5	6	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	Dr. J. D. Miller, H. O.
66	9	50	281	8	6	30	47	7	22	14	2	106	32	10	47	Dr. G. C. Ashmun, H. O.
.....			3	.....	.....	.....	6	5	8	6	.....	20	.....	7	11	Alex. Harnden, H. O.
24	3	19	54	4	.....	2	6	.....	.....	.....	.....	2	.....	.....	.....	Dr. F. Gunsulius, H. O.
.....			3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Dr. E. D. Merriam, H. O.
1	1	.....	4	1	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	Dr. G. R. Edwards, H. O.
18	2	15	59	1	2	3	4	1	5	1	.....	22	11	3	10	Dr. J. M. Weaver, H. O.
.....			4	.....	.....	1	1	.....	1	.....	.....	1	.....	.....	.....	Dr. D. P. Aldrich, H. O.
1		1	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Dr. J. W. N. Vogt, H. O.
1		1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	C. P. Washburn, H. O.
1		1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Dr. C. C. McLaughlin, H. O.
2	1	1	11	1	.....	1	.....	.....	.....	3	.....	.....	.....	.....	.....	Wm. Gibbs, H. O.
.....			1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	C. E. Houghton, H. O.
.....			2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	J. O. Hess, H. O.
4		3	2	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	Dr. Webb J. Kelly, H. O.
4	1	3	14	.....	.....	2	1	.....	.....	.....	.....	.....	.....	.....	.....	Dr. George Trebel, H. O.
1		1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Dr. F. Hodge, H. O.
1		1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	L. May, H. O.
.....			1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	J. P. Holcomb, H. O.
1		1	5	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Dr. J. W. Lewis, H. O.
1		1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	A. House
.....			1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Dr. I. C. Wright, H. O.
.....			3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Dr. S. D. Spence, H. O.
2	1	1	5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Dr. R. Harvey Reed, H. O.
.....			4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Dr. A. H. Stockham, H. O.
2		2	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	J. K. Redd, H. O.
.....			1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Dr. G. W. Rhonehouse, H. O.
1		1	6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Dr. W. S. Bookwalter, H. O.
5		3	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Dr. John T. Sutphen, H. O.
1		2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Dr. Otto Palm, Sen., H. O.
2		1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Dr. Charles W. Cable, H. O.
.....			1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Dr. W. H. Cornwell, H. O.
3	1	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Thomas R. Mayhew, H. O.
1		1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Dr. S. P. Grill, H. O.
1		1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	H. P. Sanford, Clerk.
1		1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Dr. R. M. O'Ferrall, H. O.
1		1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Dr. C. C. Fulton, H. O.
1		1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	T. R. Mason, H. O.
2		2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Dr. T. T. Church, H. O.
.....			2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	C. E. Whittington, Clerk.
9		9	27	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Dr. M. H. Collins, H. O.
21	3	14	59	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Dr. H. H. Seys, H. O.
.....			2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Dr. G. A. Collamore, H. O.
.....																Dr. J. E. Groves, H. O.
3		3	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Dr. W. M. Grimes, H. O.
.....																Dr. H. C. Houston, H. O.
.....																Dr. Wm. H. Rike, H. O.
1		1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	H. H. Bricker, H. O.
2		2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	J. M. Edwards, H. O.
.....																Dr. S. H. Smith, H. O.
.....																Dr. Austin Hutt, H. O.
1		1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	G. T. Brooks, Clerk.
10		1	6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Dr. J. M. Barrett, H. O.
5		8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Dr. A. D. DeHaven, H. O.
7		5	28	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Dr. W. L. Buechner, H. O.
.....		7	10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Dr. H. T. Sutton, H. O.
380	35	290	1088	41	29	104	103	37	115	59	4	380	189	61	149	

don, 1 from pneumonia; New Straitsville, 1 from bronchitis; Plymouth, 1 from rheumatism and 1 from old age; Richland, 1 from phthisis pulmonalis; Smithville, 1 from old age and 1 from asthma; Springboro, 1 from apoplexia; West Milton, 1 from phthisis pulmonalis; West Liberty, 1 from group; Pemberville, 1 from la grippe. No deaths occurred during February at Ashley, Garretttsville, Pioneer, Rocky Ridge, St. Paris, Utica and West Alexandria.

* Premature and still births excluded.

ABSTRACT OF REPORTS OF DEATHS AND THEIR CAUSES, IN THE FOLLOWING

Place.	Estimated population.	Total deaths, all causes.*	Annual rate per 1,000.*	Total under five years.	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis.	Diarrhoea	Dysentery.	Measles.	Scarlet fever.	Typhoid fever.	Whooping cough.
Akron.....	30,000	42	16.80	15	12	5					2	1		
Alliance.....	10,000	7	8.40											
Ashtabula.....	6,500	11	20.31	3	1	1								
Bedford.....	1,000	3	36.00											
Bellaire.....	12,000	18	18.00	10	6				1				3	2
Bellevue.....	3,500	7	24.00	1	1									
Bloomington.....	800	3	45.00	1										
Canton.....	25,000	33	15.84	7	4									
Chillicothe.....	14,000	15	10.29	6	4								3	1
Cincinnati.....	325,000	484	17.87	190	103	46		3	3	3	5	11	13	
Cleveland.....	235,000	420	21.41	216	88	37			1	18	4	6	6	
Columbus.....	101,000	101	12.00	25	14	7		1				2		
Dayton.....	60,000	80	16.00	32	12	6		1		4				
Defiance.....	7,000	6	12.86	2										
Delaware.....	9,000	4	5.34											
Delphos.....	5,000	4	9.60		2			1						
Dunkirk.....	1,800	3	20.00											
East Liverpool.....	10,000	12	14.40	3	2							2		
Felicity.....	1,000	4	48.00		3									3
Fostoria.....	8,000	9	13.50	2	1									
Galion.....	7,000	4	6.85											
Garrettsville.....	1,100	3	32.82	2										
Hamilton.....	20,000	20	12.00	7	4	1							2	
Lancaster.....	8,000	6	10.50											
Lebanon.....	3,000	6	24.00											
Mansfield.....	15,000	9	7.20	4	2	1								
Marion.....	8,000	10	15.00	4										
Mt. Gilead.....	3,500	3	12.87		1									
Miamisburg.....	3,500	4	13.71	1				1						
Middletown.....	8,200	5	7.31		1									
Nelsonville.....	5,000	7	16.80	1										
New Straitsville.....	3,000	6	24.00	2										
North Amherst.....	1,600	3	22.50		1									
Oberlin.....	4,000	4	12.00											
Painesville.....	5,000	5	12.00											
Piqua.....	10,000	10	12.00	1	1							1		
Plymouth.....	1,200	4	40.00		1									
Salem.....	6,000	3	6.00	1										
Shawnee.....	3,000	3	12.00		1									
Springfield.....	38,000	32	10.00	14	3	1								
Toledo.....	89,000	111	14.48	46	33	25		1	1	1	1	1		
Troy.....	1,200	7	7.00		2	2								
Union City.....	1,500	5	44.00											
Urbana.....	8,000	16	24.00		2							1		
Washington C. H.....	7,500	4	6.40	3										
Warren.....	8,600	3	4.50	2	1									1
Waverly.....	1,600	6	45.00	3	4					3				
West Cleveland.....		7		1						1				
Wooster.....	8,500	9	12.70	2										
Xenia.....	10,000	15	18.00	15	4	2								
Youngstown.....	25,000	31	15.00	12	4	2						1		
Zanesville.....	25,000	28	13.40	6	11	6						1	3	
Total population, 1,257,350.....		1,685	15.28	647	338	145		7	5	5	35	7	34	30

* Premature and still-births excluded.

Bainbridge reports 1 death from gastro-enteritis; Canfield 2 from bronchitis and 1 from whooping cough; Carthage 1 from croup; Clyde 1 from pneumonia and 1 from whooping cough; Cuyahoga Falls 1 from chronic bronchitis; Forest 1 from rheumatism and 1 from old age; Flushing 1 from Bright's disease and 1 from pneumonia; Glendale 1 from apoplexia; Kent 2 from cancer; Logan 1 from typho-malarial fever and 1 from consumption; McComb 1 from croup, 1 from apo-

CITIES AND TOWNS OF OHIO, DURING THE MONTH OF FEBRUARY, 1890.

Total constitutional diseases.	Cancer.	Phthisis, pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still-birth.	Authority.
13	1	11	15	1	1	2	2	2	2	1	3	1	1	1	1	Dr. L. S. Ebright, H. O.
1	1	1	6	1	1	1	1	1	1	1	1	1	1	1	2	Dr. James Bates, H. O.
2	2	2	6	1	1	1	1	1	2	1	2	2	1	1	1	Dr. A. W. Hopkins, H. O.
3	1	2	9	1	1	3	2	1	1	1	1	1	1	3	3	A. C. Critchlow, H. O.
1	1	1	2	1	1	1	1	1	1	1	1	2	3	3	3	Dr. J. Park West, H. O.
1	1	1	2	1	1	1	1	1	1	1	1	1	3	3	3	John Earls, H. O.
3	3	3	16	1	1	2	2	1	4	1	4	4	7	3	2	Dr. L. Dillinger, H. O.
5	5	5	5	1	2	1	1	1	1	1	1	1	1	3	3	Dr. J. F. Marchand, H. O.
89	5	67	239	5	4	43	21	11	19	20	1	71	43	10	35	Dr. J. D. Miller, H. O.
55	6	38	246	2	5	23	30	7	21	7	3	112	27	4	89	Dr. Byron Stanton, H. O.
15	1	13	55	1	2	3	4	9	7	6	16	9	6	6	6	Dr. G. C. Ashmun, H. O.
17	3	10	43	1	1	3	5	2	3	7	7	7	3	6	6	Dr. Lee McBriar, H. O.
2	2	2	2	1	1	3	2	3	3	7	1	1	1	1	1	Dr. J. M. Weaver, H. O.
1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	Dr. A. Berchtold, H. O.
2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	Dr. J. W. N. Vogt, H. O.
2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	C. P. Washburn, H. O.
2	2	2	4	1	1	2	1	1	1	1	2	2	2	2	1	Dr. C. C. McLaughlin, H. O.
4	3	3	1	1	1	1	1	1	1	1	1	3	3	3	1	Wm. Gibbs, H. O.
3	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	C. E. Houghton, H. O.
5	2	3	5	1	1	1	1	1	1	1	1	1	1	1	1	J. O. Hess, H. O.
3	3	3	2	1	1	1	1	1	1	1	1	1	1	1	1	Dr. Webb J. Kelly.
2	2	1	3	1	1	1	1	1	1	1	1	1	1	1	1	Dr. L. L. Johnson, H. O.
2	2	2	5	1	1	1	1	1	1	1	1	1	1	1	1	Dr. George Trebel, H. O.
3	1	2	5	1	1	1	1	1	1	1	1	1	1	1	1	Dr. J. W. Lewis, H. O.
1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	Dr. J. B. Graham, Sec'y.
2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	Dr. R. Harvey Reed, H. O.
4	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	J. K. Redd, H. O.
1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	Geo. H. Hales.
2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	Dr. W. S. Bookwalter, H. O.
4	1	3	1	1	1	1	1	1	1	1	1	3	1	1	1	Dr. G. D. Lummis, H. O.
1	1	1	5	1	1	1	1	1	1	1	1	1	1	1	1	Dr. Charles W. Cable, H. O.
1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	Barney Davis, H. O.
3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Dr. W. H. Cornwell, H. O.
3	1	1	5	1	1	1	1	1	1	1	1	1	1	1	1	T. R. Mayhew, H. O.
1	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1	H. P. Sandford, Clerk.
5	1	4	14	1	1	1	1	1	3	5	2	2	7	6	6	Dr. R. M. O'Ferrall, H. O.
14	4	10	51	1	1	5	4	2	3	2	11	8	5	31	31	Dr. R. D. Sykes, H. O.
2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	Dr. T. T. Church, H. O.
2	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	C. E. Whittington, Clerk.
4	3	3	4	2	1	1	1	1	1	1	1	1	6	2	2	Dr. H. H. Seys, H. O.
3	3	3	1	1	1	1	1	1	1	1	1	1	1	1	1	Dr. G. A. Collamore, H. O.
1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	Dr. J. G. Senour, H. O.
5	5	5	19	1	1	1	1	1	1	1	1	1	1	1	1	Dr. W. M. Grimes, H. O.
2	2	2	11	1	2	1	1	1	1	1	1	1	1	1	1	Dr. H. C. Houston, H. O.
295	31	216	834	25	22	88	80	39	91	55	6	271	148	48	196	J. M. Edwards, H. O.
																Dr. W. C. Hunt, H. O.
																Dr. Austin Hutt.
																G. L. Brooks, Clerk.
																Dr. J. M. Barrett, H. O.
																Dr. A. D. DeHaven, H. O.
																Dr. W. L. Buechner, H. O.
																Dr. H. T. Sutton, H. O.

plexia and 1 from old age; New Bremen 1 from consumption; New London 1 from influenza; Ravenna 1 from croup and 1 from pneumonia; Richwood 1 from influenza and 1 from enteritis; Smithville 1 from measles; Uhrichsville 1 from peritonitis and 1 from old age, and West Alexandria 1 from inanition. Conneaut, Higginsport, Mechanicsburg, St. Marks and West Milton report no deaths during February.

ABSTRACT OF REPORTS OF DEATHS AND CAUSES, IN THE FOLLOWING

Place and population. (estimated.)	Total deaths, all causes.*	Annual rate per 1,000.*	Total under five years.	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis.	Diarrhoea.	Dysentery.	Measles.	Scarlet fever.	Typhoid fever.	Whooping cough.
Ada, 2,700.....	5	22.00	.....	1	.....	.....	.....	.....	.....	1	.....	.....	.....
Akron, 30,000.....	38	15.20	13	16	6	.....	.....	.....	1	3	1	.....	.....
Alliance, 10,000.....	10	12.00	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ashtabula, 6,500.....	6	11.08	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bellaire, 12,000.....	18	18.00	13	5	.....	.....	.....	.....	.....	5	.....	.....	.....
Canfield, 1,100.....	3	32.72	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Canton, 25,000.....	24	11.52	9	7	2	.....	.....	.....	.....	2	.....	1	.....
Chillicothe, 14,000.....	12	10.28	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cincinnati, 325,000.....	569	20.01	186	104	37	1	5	2	1	4	1	17	6
Cleveland, 235,000.....	493	25.11	200	95	21	1	.....	6	1	24	4	10	7
Clyde, 3,000.....	3	10.29	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Columbus, 101,000.....	108	12.83	34	20	3	.....	2	1	1	1	4	3	1
Crestline, 3,300.....	5	18.09	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cuyahoga Falls, 3,500.....	4	13.71	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Dayton, 60,000.....	82	16.40	22	7	1	.....	1	.....	.....	1	.....	.....	1
Defiance, 7,000.....	9	15.43	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Delaware, 9,000.....	9	9.00	1	1	1	.....	.....	.....	.....	.....	.....	.....	.....
Delphos, 5,000.....	3	7.10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
East Liverpool, 10,000.....	13	15.60	5	2	.....	.....	.....	.....	.....	.....	.....	2	.....
Fostoria, 8,000.....	11	16.50	.....	1	.....	.....	1	.....	.....	.....	.....	.....	.....
Hamilton, 20,000.....	23	13.80	14	2	.....	.....	1	.....	.....	.....	.....	1	.....
Lancaster, 8,000.....	14	21.00	2	2	1	.....	1	.....	.....	.....	.....	.....	.....
Lebanon, 3,000.....	4	16.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Linwood, 1,300.....	2	18.46	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	1
Logan, 3,700.....	2	6.48	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	1
Mansfield, 15,000.....	14	11.20	6	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Marion, 8,000.....	8	12.00	3	6	4	.....	.....	.....	.....	.....	2	.....	.....
Middletown, 8,200.....	8	11.71	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Nelsonville, 5,000.....	7	16.80	1	3	.....	.....	1	.....	.....	.....	.....	.....	.....
North Amherst, 1,600.....	11	82.50	.....	2	.....	.....	.....	.....	.....	2	.....	.....	.....
Oberlin, 4,000.....	4	12.00	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ottawa, 2,000.....	23	138.00	.....	6	.....	.....	.....	.....	.....	.....	.....	.....	.....
Painesville, 5,000.....	13	31.20	1	2	1	.....	.....	.....	.....	.....	.....	.....	.....
Piqua, 10,000.....	14	16.80	1	3	.....	.....	.....	.....	.....	1	.....	.....	.....
Portsmouth, 14,000.....	16	13.71	5	1	.....	.....	.....	1	.....	.....	.....	.....	.....
Richwood, 2,000.....	5	30.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Salem, 6,000.....	5	10.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Springfield, 38,000.....	39	12.32	14	8	4	.....	.....	.....	.....	.....	.....	2	.....
Toledo, 89,000.....	136	17.74	54	38	22	.....	1	2	.....	.....	3	1	.....
Uhrichsville, 4,300.....	6	16.74	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Urbana, 8,000.....	14	21.00	5	5	3	.....	.....	1	.....	.....	.....	.....	1
Utica, 1,000.....	3	36.00	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Washington C. H., 7,500.....	9	14.40	4	2	.....	.....	1	.....	.....	.....	.....	.....	.....
West Cleveland, —.....	7	.....	1	2	.....	.....	.....	.....	.....	.....	2	.....	.....
Wooster, 8,500.....	9	12.71	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Xenia, 10,000.....	15	18.00	5	2	2	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown, 25,000.....	25	12.00	12	4	2	.....	.....	.....	.....	.....	1	.....	.....
Zanesville, 25,000.....	38	18.24	5	9	4	.....	.....	.....	.....	1	1	.....	.....
Totals: population.....1,271,800	1,927	18.97	630	367	115	2	14	13	4	46	16	40	19

* Premature and still births excluded.

Ashley reports 1 death from old age, Bedford 1 from diphtheria, Bellevue 1 from tonsillitis, Bloomingburg 1 from old age, Carthage 1 from meningitis, Galion 1 from pneumonia and 1 from old age, Garrettsville 1 from cancer and 1 from heart disease, Higginsport 2 deaths from consumption, Hudson 1 from cancer and 1 from pneumonia, Kent 1 from inflammation of the brain, McComb 1 from chronic bronchitis, Miamisburg 1 from typhoid fever, New Bremen 1 from consumption,

CITIES AND TOWNS OF OHIO, DURING THE MONTH OF MARCH, 1890.

Total constitutional diseases.	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still-born.	Authority.
5	1	4	14	1	1	1	1	1	1	1	1	2	2	1	3	W. H. Morrow, H. O.
5	1	4	14	1	1	1	1	1	1	1	1	2	2	1	3	Dr. L. S. Ebright, H. O.
5	1	4	14	1	1	1	1	1	1	1	1	2	2	1	3	Dr. James Bates, H. O.
5	1	4	14	1	1	1	1	1	1	1	1	2	2	1	3	Dr. A. W. Hopkins, H. O.
5	1	4	14	1	1	1	1	1	1	1	1	2	2	1	3	Dr. J. Park West, H. O.
5	1	4	14	1	1	1	1	1	1	1	1	2	2	1	3	A. W. Yeats, H. O.
5	1	4	14	1	1	1	1	1	1	1	1	2	2	1	3	Dr. J. F. Marchand, H. O.
105	5	74	300	10	5	38	17	14	36	18	2	85	44	16	53	Dr. J. D. Miller, H. O.
73	13	46	264	9	8	26	45	10	22	24	2	83	42	19	64	Dr. J. W. Prendergast, H. O.
1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	Dr. G. C. Ashmun, H. O.
19	1	18	57	1	5	3	5	4	3	10	1	16	4	5	14	Alex. Harnden, H. O.
2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	Dr. Lee McBriar, H. O.
21	4	15	43	1	4	1	4	1	2	3	10	7	3	4	4	Dr. G. R. Edwards, H. O.
5	5	5	2	1	1	1	1	1	1	1	1	1	1	1	1	Dr. W. S. Hough, H. O.
2	1	4	12	1	1	1	1	1	1	1	1	1	1	1	1	Dr. J. M. Weaver, H. O.
2	1	4	12	1	1	1	1	1	1	1	1	1	1	1	1	Dr. D. P. Aldrich, H. O.
2	1	4	12	1	1	1	1	1	1	1	1	1	1	1	1	Dr. J. W. N. Vogt, H. O.
2	1	4	12	1	1	1	1	1	1	1	1	1	1	1	1	C. P. Washburn, H. O.
2	1	4	12	1	1	1	1	1	1	1	1	1	1	1	1	Wm. Gibbs, H. O.
2	1	4	12	1	1	1	1	1	1	1	1	1	1	1	1	J. O. Hess, H. O.
2	1	4	12	1	1	1	1	1	1	1	1	1	1	1	1	Dr. Geo. T. rebel, H. O.
2	1	4	12	1	1	1	1	1	1	1	1	1	1	1	1	Dr. J. W. Lewis, H. O.
2	1	4	12	1	1	1	1	1	1	1	1	1	1	1	1	Dr. J. B. Grabam, H. O.
2	1	4	12	1	1	1	1	1	1	1	1	1	1	1	1	E. W. Wilkinson, H. O.
2	1	4	12	1	1	1	1	1	1	1	1	1	1	1	1	Dr. I. C. Wright, H. O.
2	1	4	12	1	1	1	1	1	1	1	1	1	1	1	1	Dr. R. Harvey Reed, H. O.
2	1	4	12	1	1	1	1	1	1	1	1	1	1	1	1	J. K. Redd, H. O.
2	1	4	12	1	1	1	1	1	1	1	1	1	1	1	1	Dr. John T. Sutphen, H. O.
2	1	4	12	1	1	1	1	1	1	1	1	1	1	1	1	Dr. Charles W. Cable, H. O.
2	1	4	12	1	1	1	1	1	1	1	1	1	1	1	1	Dr. W. H. Cornwell, H. O.
2	1	4	12	1	1	1	1	1	1	1	1	1	1	1	1	T. R. Mayhew, H. O.
2	1	4	12	1	1	1	1	1	1	1	1	1	1	1	1	Dr. C. E. Beardsley, H. O.
2	1	4	12	1	1	1	1	1	1	1	1	1	1	1	1	H. P. Sanford, Clerk.
2	1	4	12	1	1	1	1	1	1	1	1	1	1	1	1	Dr. R. M. O'Ferrall, H. O.
2	1	4	12	1	1	1	1	1	1	1	1	1	1	1	1	Dr. C. C. Fulton, H. O.
2	1	4	12	1	1	1	1	1	1	1	1	1	1	1	1	Dr. J. Oatley, H. O.
2	1	4	12	1	1	1	1	1	1	1	1	1	1	1	1	Dr. T. T. Church, H. O.
11	2	8	16	1	1	2	1	2	2	2	7	5	1	9	9	Dr. H. H. Seys, H. O.
16	3	13	63	2	3	4	7	4	9	10	6	11	6	18	18	Dr. G. A. Collamore, H. O.
2	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	Dr. J. E. Groves, H. O.
2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Dr. H. C. Houston, H. O.
2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Dr. G. W. Garrison, H. O.
2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	J. M. Edwards, H. O.
2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	G. T. Brooks, Clerk.
4	3	2	5	1	1	1	1	1	1	1	1	1	2	1	1	Dr. J. E. Barrett, H. O.
1	1	10	1	1	1	1	1	1	1	1	1	4	1	1	1	Dr. A. D. DeHaven, H. O.
2	2	13	3	1	3	2	2	2	1	1	3	5	1	4	4	Dr. W. L. Buechner, H. O.
4	4	18	1	1	1	2	1	5	1	1	4	3	2	3	3	Dr. H. T. Sutton, H. O.
335	39	246	974	41	36	92	94	53	111	67	3	252	162	77	190	

New Straitsville and Ravenna 1 each from consumption, St. Paris 1 from peritonitis, Shelby 1 from pneumonia, Shawnee 1 from brain congestion, Smithville 1 from measles, South Charleston 1 from consumption, Springboro 1 from pneumonia and 1 from old age, Union City 1 from pneumonia, Versailles 1 from peritonitis and 1 from premature birth, West Milton 1 from premature birth, Waverly 1 from Bright's disease and 1 from heart disease. Bainbridge, Mt. Gilead, New London and West Liberty report no deaths for March.

ABSTRACT OF REPORTS OF DEATHS AND CAUSES, IN THE FOLLOWING

Place and population, (estimated).	Total deaths, all causes.*	Annual rate per 1,000.*	Total under five years.	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis.	Diarrhoea.	Dysentery.	Measles.	Scarlet fever.	Typhoid fever.	Whooping cough.
Akron, 30,000.....	40	16.00	.....	11	4	.....	.....	.....	1	1	1	.....	1
Alliance, 10,000.....	13	15.60	6	1	.....	.....	.....	.....	.....	.....	1	.....	.....
Ashtabula, 6,500.....	8	14.77	6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bellaire, 12,000.....	20	20.00	13	5	.....	.....	.....	.....	.....	3	.....	2	.....
Canton, 25,000.....	21	10.40	12	5	1	.....	.....	.....	.....	.....	.....	2	.....
Chillicothe, 14,000.....	13	11.14	2	2	.....	.....	.....	.....	.....	1	.....	.....	.....
Cincinnati, 325,000.....	491	16.89	179	85	86	1	3	3	1	9	3	9	4
Cleveland, 235,000.....	417	21.29	160	81	22	1	1	11	2	14	2	7	4
Columbus, 101,000.....	103	12.23	28	13	1	.....	2	1	.....	1	.....	4	.....
Crestline, 3,300.....	5	15.06	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cuyahoga Falls, 3,500.....	4	13.71	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Dayton, 60,000.....	85	17.00	29	9	2	.....	1	.....	.....	.....	.....	1	.....
Defiance, 7,000.....	7	12.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Delaware, 9,000.....	5	6.66	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Delphos, 5,000.....	6	12.40	.....	4	.....	.....	1	.....	.....	.....	.....	.....	.....
East Liverpool, 10,000.....	9	10.80	4	2	1	.....	.....	.....	.....	.....	.....	1	.....
Fostoria, 8,000.....	7	10.50	1	5	.....	.....	.....	.....	2	.....	.....	.....	.....
Geneva, 3,000.....	3	12.00	.....	1	.....	.....	.....	.....	.....	.....	1	.....	.....
Hamilton, 20,000.....	22	13.20	5	2	1	.....	1	.....	.....	.....	.....	.....	.....
Ironton, 12,000.....	20	40.00	.....	2	.....	.....	.....	.....	.....	.....	.....	1	.....
Mansfield, 15,000.....	10	8.00	2	1	1	.....	.....	.....	.....	.....	.....	.....	.....
Marion, 8,000.....	13	19.50	4	2	.....	.....	.....	.....	.....	1	.....	1	.....
Milford, 1,500.....	6	48.00	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Nelsonville, 5,000.....	6	14.40	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
North Amherst, 1,600.....	4	30.00	.....	2	1	.....	.....	.....	.....	1	.....	.....	.....
Oberlin, 4,000.....	5	15.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Painesville, 5,000.....	9	21.60	1	2	1	.....	.....	.....	.....	.....	.....	.....	.....
Piqua, 10,000.....	15	18.00	7	3	1	.....	.....	.....	.....	.....	.....	.....	.....
Portsmouth, 14,000.....	11	9.43	4	3	.....	.....	.....	.....	.....	1	.....	.....	.....
Richwood, 2,000.....	3	18.00	.....	2	.....	.....	1	1	.....	.....	.....	.....	.....
Salem, 6,000.....	5	10.00	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sandusky, 23,000.....	20	14.35	.....	1	.....	.....	.....	.....	.....	.....	1	.....	.....
Smithville, 800.....	3	45.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Springfield, 38,000.....	38	12.00	9	5	.....	.....	.....	1	.....	.....	2	1	.....
Toledo, 89,000.....	104	14.02	36	27	21	1	.....	.....	.....	.....	.....	1	1
Uhrichsville, 4,300.....	3	8.37	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Urbana, 8,000.....	6	9.00	1	3	1	.....	.....	.....	.....	.....	.....	2	.....
Washington C. H., 7,500.....	5	8.00	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Wooster, 8,500.....	8	11.29	.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....
Xenia, 10,000.....	13	15.60	2	2	.....	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown, 25,000.....	49	23.60	27	7	1	.....	2	.....	.....	.....	1	1	.....
Zanesville, 25,000.....	23	11.04	2	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Totals: population, 1,277,400...	1,687	15.86	554	296	96	3	12	17	6	35	12	33	11

*Premature and still-births not included.

Ashley reports 1 death from old age; Bedford 1 from old age and 1, cause not stated; Bellevue 1 from phthisis pulmonalis; Carthage 1 from old age; Clyde 1 from phthisis pulmonalis and 1 from pneumonia; Felicity 1 from apoplexia; Galion 1 from consumption, 1 from heart disease and 1 from inanition; Garrettsville 1 from pyæmia; Hudson 1 from heart disease and 2 from old age; Kent 1 from inflammation of the brain and 1 from old age; Logan 1 from whooping cough; Me-

CITIES AND TOWNS OF OHIO, DURING THE MONTH OF APRIL, 1890.

Total constitutional diseases.	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental disease.	Total violence.	Premature and still born.	Authority.
6	3	22	1	2	1	2	2	2	2	2	2	6	1	5	Dr. L. S. Ebright, H. O.	
1	1	1	1	1	1	1	1	1	1	1	1	7	4	6	Dr. James Bates, H. O.	
3	1	13	1	1	1	1	1	1	1	1	1	4	1	1	Dr. A. W. Hopkins, H. O.	
1	1	13	1	1	1	1	1	1	1	1	1	7	1	1	Dr. J. Park West, H. O.	
1	1	9	1	1	1	1	1	1	1	1	1	1	1	2	Dr. J. F. Marchand, H. O.	
100	12	72	256	6	3	20	20	5	24	20	2	70	27	18	Dr. J. D. Miller, H. O.	
58	9	38	236	6	7	37	43	15	16	14	2	69	23	19	Dr. J. W. Prendergast, H. O.	
31	8	19	47	2	1	4	5	7	7	3	1	11	4	3	Dr. G. C. Ashmun, H. O.	
13	11	47	3	1	4	3	1	6	4	10	9	1	4	10	Dr. Lee McBriar, H. O.	
2	3	3	1	3	1	1	1	1	1	1	1	1	1	1	Dr. G. R. Edwards, H. O.	
1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	Dr. W. S. Hough, H. O.	
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Dr. J. M. Weaver, H. O.	
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Dr. D. P. Aldrich, H. O.	
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Dr. J. W. N. Vogt, H. O.	
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	C. P. Washburn, H. O.	
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Wm. Gibbs, H. O.	
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	J. O. Hess, H. O.	
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Dr. G. W. Foster, H. O.	
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Dr. Geo. Trebel, H. O.	
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Dr. N. K. Moxley, Jr., H. O.	
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Dr. R. Harvey Reed, H. O.	
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	J. K. Redd, H. O.	
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Dr. Otto Palm, Sen., H. O.	
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Dr. Chas. W. Cable, H. O.	
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Dr. W. H. Cornwell, H. O.	
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	T. R. Mayhew, H. O.	
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	H. P. Sanford, Clerk.	
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Dr. R. M. O'Ferrall, H. O.	
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Dr. C. C. Fulton, H. O.	
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Dr. J. Oatley, H. O.	
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Dr. T. T. Church, H. O.	
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Dr. Elwood Stanley, H. O.	
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Dr. J. W. Bricker, H. O.	
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Dr. H. H. Seys, H. O.	
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Dr. G. A. Collamore, H. O.	
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Dr. J. E. Groves, H. O.	
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Dr. H. C. Houston, H. O.	
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	J. M. Edwards, H. O.	
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Dr. J. E. Barrett, H. O.	
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Dr. A. D. DeHaven, H. O.	
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Dr. W. L. Buechner, H. O.	
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Dr. H. T. Sutton, H. O.	
305	41	218	896	34	26	79	96	46	87	58	6	249	113	47	148	

chanicsburg 1 from heart disease; New Bremen 1 from Bright's disease; New Straitsville 1 from bronchitis; Pioneer 1 from inflammation of the brain; Plymouth 1 from diabetes and 1 from old age; Union City 1 from heart disease and 1 from paralysis; Utica 1 from diphtheria; Waverly 1 from old age; West Milton 1 from liver disease; West Liberty, New London and Bloomingburg report no deaths for April.

ABSTRACT OF THE REPORTS OF DEATHS AND THEIR CAUSES, IN THE FOL-

Place.	Estimated population.	Total deaths, all causes.*	Annual rate per 1,000.*	Total under five years.	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis.	Diarrhea.	Dysentery.	Measles.	Scarlet fever.	Typhoid fever.	Whooping cough.
Akron	30,000	48	19.20	26	14	2	.....	.....	.....	.....	3	1	.....	1
Alliance	10,000	15	18.00	2	2	1	.....	.....	.....	.....	.....	.....	.....	.....
Ashtabula	6,500	8	14.77	1	1	1	.....	.....	.....	.....	.....	.....	.....	.....
Bellaire	12,000	9	9.00	5	3	.....	.....	.....	2	.....	.....	.....	.....	.....
Canton	25,000	32	15.36	13	3	.....	.....	.....	.....	.....	3	.....	.....	.....
Chillicothe	14,000	5	6.86	1	2	1	.....	.....	.....	.....	.....	.....	.....	.....
Cincinnati	325,400	514	18.95	197	99	41	2	5	7	2	6	2	14	5
Cleveland	235,000	480	20.21	177	107	20	.....	1	14	4	10	.....	12	9
Clifton	1,800	3	27.69	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Columbus	101,000	115	13.66	42	14	1	1	3	.....	.....	7	1	1	.....
Crestline	3,300	5	18.18	2	2	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cuyahoga Falls	3,500	7	24.00	4	3	.....	.....	.....	.....	.....	3	.....	.....	.....
Dayton	60,000	63	13.60	19	8	2	.....	.....	1	.....	.....	.....	1	.....
Defiance	7,000	7	12.00	3	1	1	.....	.....	.....	.....	.....	.....	.....	.....
Delphos	5,000	10	24.00	2	4	.....	.....	.....	.....	.....	.....	1	.....	.....
East Liverpool	10,000	11	13.20	8	3	.....	.....	.....	.....	.....	.....	.....	2	.....
Fostoria	8,000	5	7.50	2	1	1	.....	.....	.....	.....	.....	.....	.....	.....
Fremont	12,000	12	12.00	2	2	.....	.....	1	.....	.....	.....	.....	.....	.....
Gallion	7,000	3	5.20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Garrettsville	1,100	1	43.63	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hamilton	20,000	22	13.20	5	3	2	.....	1	.....	.....	.....	.....	.....	.....
Ironton	12,000	14	14.00	3	5	.....	.....	.....	2	.....	.....	.....	1	.....
Kent	4,000	4	12.00	2	1	.....	1	.....	.....	.....	.....	.....	.....	.....
Lancaster	8,000	10	15.00	3	2	1	.....	.....	1	.....	.....	.....	.....	.....
Logan	3,700	2	6.49	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mansfield	15,000	17	13.60	5	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Marion	8,000	10	15.00	2	5	.....	.....	.....	.....	.....	4	1	.....	.....
Mechanicsburg	2,000	3	18.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Miamisburg	3,500	6	20.57	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Middletown	8,200	14	20.49	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
New Concord	800	2	30.00	.....	1	.....	.....	.....	.....	.....	.....	.....	1	.....
Nelsonville	5,600	4	9.60	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
North Amherst	1,600	5	37.50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Oberlin	4,000	5	15.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Oak Harbor	2,000	3	18.00	2	1	.....	1	.....	.....	.....	.....	.....	.....	.....
Piqua	10,000	18	21.60	4	5	3	.....	.....	.....	1	.....	.....	1	.....
Ravenna	7,500	4	6.40	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Salem	6,000	5	10.00	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sandusky	23,000	11	5.74	.....	1	.....	.....	.....	.....	.....	.....	1	.....	.....
Shawnee	3,000	2	8.00	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Springfield	38,000	44	13.89	4	4	.....	.....	.....	.....	1	.....	1	.....	.....
Toledo	894,000	105	29.21	40	25	17	.....	1	.....	.....	4	.....	1	2
Urbana	8,000	9	13.25	5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Washington C. H.	7,500	10	16.00	6	4	.....	.....	1	.....	.....	.....	.....	.....	.....
Wooster	8,500	7	9.88	.....	3	2	.....	.....	.....	.....	.....	.....	.....	.....
Xenia	10,000	10	12.00	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown	25,000	18	8.64	6	5	.....	1	1	.....	.....	.....	1	1	.....
Zanesville	25,000	27	12.96	7	3	.....	.....	1	.....	.....	.....	.....	.....	.....
Totals	1,275,075	1,781	15.59	612	344	97	6	17	27	9	40	10	36	20

* Premature and still-births excluded.

Bainbridge reports 1 death from phthisis pulmonalis; Bellevue 1 from phthisis pulmonalis and 1 from old age; Bloomingburg 1 from old age; Carthage 2 from old age; Dalton 1 from heart disease; Felicity 1 from inflammation of the bowels and 1 from phthisis pulmonalis; Glendale 2 from phthisis pulmonalis; Hudson 1 from inflammation of the kidneys; New Straitsville 1 from puer-

LOWING CITIES AND TOWNS OF OHIO, DURING THE MONTH OF MAY, 1890.

Total constitutional diseases.	Cancer.	Phthisis, pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still-birth.	Authority.
4	1	27	4	1	.....	4	1	1	1	1	11	2	1	1	Dr. L. S. Ebright, H. O.	
7	1	4	1	.....	.....	.....	.....	.....	.....	.....	1	1	.....	.....	Dr. James Bates, H. O.	
1	1	5	.....	.....	.....	.....	.....	.....	.....	.....	4	1	.....	.....	Dr. A. W. Hopkins, H. O.	
3	1	3	.....	.....	1	.....	.....	.....	.....	.....	1	1	2	.....	Dr. J. Park West, H. O.	
3	1	17	3	.....	.....	3	.....	.....	.....	.....	6	5	4	.....	Dr. J. F. Marchand, H. O.	
1	1	3	.....	.....	.....	.....	.....	.....	.....	.....	2	2	.....	.....	Dr. J. D. Miller, H. O.	
93	11	64	251	8	8	25	22	12	23	28	2	41	43	28	58	Dr. Byron Stanton, H. O.
58	7	34	274	4	12	20	52	15	27	32	3	75	54	14	64	Dr. G. C. Ashmun, H. O.
1	1	1	1	.....	.....	.....	.....	.....	.....	.....	1	1	.....	.....	.....	Dr. Wm. Herbert Bell, H. O.
24	2	20	59	1	3	1	4	6	12	4	1	19	8	10	12	Dr. F. Gunsaulus, H. O.
1	1	2	.....	.....	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	Dr. G. R. Edwards, H. O.
1	1	1	2	1	.....	.....	.....	.....	.....	1	.....	1	.....	.....	.....	Dr. W. S. Hough, H. O.
17	2	12	34	1	.....	1	4	5	.....	.....	5	10	3	6	.....	Dr. J. M. Weaver, H. O.
2	.....	2	4	.....	.....	1	.....	.....	1	.....	1	1	.....	.....	.....	Dr. D. P. Aldrich, H. O.
.....	5	5	.....	.....	.....	.....	.....	.....	2	.....	1	3	.....	3	.....	C. P. Washburn, H. O.
.....	5	5	.....	.....	.....	.....	.....	.....	2	.....	1	3	.....	3	.....	Wm. Gibbs, H. O.
1	1	8	.....	.....	.....	.....	.....	3	.....	.....	5	.....	1	2	.....	J. O. Hess, H. O.
.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....	1	1	1	.....	.....	Dr. F. S. Hillbush, H. O.
.....	4	2	7	.....	.....	1	1	.....	2	.....	.....	.....	.....	.....	.....	Dr. Webb J. Kelly, H. O.
3	1	2	5	.....	.....	1	1	.....	2	.....	2	3	.....	.....	.....	Dr. L. L. Johnson, H. O.
.....	3	3	.....	.....	.....	.....	.....	1	1	.....	1	.....	.....	.....	.....	Dr. George Trebel, H. O.
3	3	4	.....	.....	.....	.....	1	3	.....	.....	1	1	.....	.....	.....	Dr. N. K. Moxley, Jr., H. O.
.....	1	1	1	.....	1	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	J. P. Holcomb, H. O.
4	1	1	9	1	1	.....	.....	3	.....	.....	.....	2	1	1	.....	Dr. J. W. Lewis, H. O.
1	.....	2	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Dr. I. C. Wright, H. O.
2	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	Dr. R. Harvey Reed, H. O.
1	.....	4	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	J. K. Redd, H. O.
4	.....	4	1	3	.....	1	1	1	.....	.....	1	3	.....	.....	.....	Dr. O. A. Nincehelter, H. O.
.....	1	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Dr. W. S. Bookwalter, H. O.
1	1	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Dr. John T. Sutphen, H. O.
2	1	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	W. S. Kline, H. O.
1	1	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Dr. Chas. W. Cable, H. O.
1	1	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Dr. N. H. Cornwell, H. O.
2	1	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	.....	Thomas R. Mayhew, H. O.
1	1	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	.....	Dr. J. M. Stewart, H. O.
9	2	6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	.....	Dr. R. M. O'Ferrall, H. O.
.....	3	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	.....	Joseph Gledhill, H. O.
1	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	.....	.....	Dr. T. T. Church, H. O.
.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Dr. Elwood Stanley, H. O.
9	1	7	22	2	2	.....	1	2	2	2	.....	3	2	2	.....	C. E. Whittington, H. O.
19	1	15	47	2	.....	4	5	2	5	1	.....	10	8	5	11	Dr. H. H. Seys, H. O.
3	1	2	3	.....	.....	.....	.....	.....	.....	.....	.....	2	3	.....	.....	Dr. G. C. Collamore, H. O.
2	1	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Dr. H. C. Houston, H. O.
.....	4	1	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	J. M. Edwards, H. O.
6	6	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Dr. J. E. Barrett, H. O.
4	1	3	8	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	Dr. A. S. Dryden, H. O.
6	1	5	14	2	.....	.....	2	1	1	3	.....	2	.....	1	1	Dr. W. L. Buechner, H. O.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	3	1	.....	Dr. H. T. Sutton, H. O.
310	35	221	896	31	31	57	109	50	107	85	9	209	168	79	173	

peral fever; Richwood 1 from cerebro-spinal meningitis; St. Paris 1 from cerebro spinal meningitis; Shelby 1 from violence; Springboro 1 from scrofula; Uhrichsville 1 from convulsions and 1 from gastritis; Union City 1 from uraemic poisoning and 1 from pleurisy; Versailles 1 from puerperal fever; Waverly 1 from dysentery and 1 from heart disease; West Milton 1 from phthisis pulmonalis and 1 from brain fever. Ashley, Clyde and West Liberty report no deaths for May.

ABSTRACT OF THE REPORTS OF DEATHS AND THEIR CAUSES, IN THE

Place.	Estimated population.	Total deaths, all causes.*	Annual rate per 1,000.*	Total under five years.	Total zymotic diseases.	Group and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis.	Diarrhea.	Dysentery.	Measles.	Scarlet fever.	Typhoid fever.	Whooping cough.
Akron	30,000	27	10.50	6	1	.....	.....	.....	.....	.....	3	.....	1	.....
Alliance	10,000	9	10.80	3	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ashtabula	6,500	8	14.14	1	2	.....	.....	.....	.....	.....	.....	1	.....	.....
Bainbridge	800	4	60.00	2	2	.....	.....	.....	2	.....	.....	.....	.....	.....
Bellaire	12,000	16	16.00	7	6	.....	3	.....	1	.....	.....	1	.....	.....
Bellevue	3,500	2	6.86	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bellevue	800	5	75.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bloomington	25,000	16	7.69	6	3	.....	2	.....	.....	.....	1	.....	.....	2
Canton	11,000	12	10.29	5	5	3	.....	.....	.....	.....	.....	.....	1	.....
Chillicothe	325,000	710	24.03	353	186	25	57	7	28	3	2	3	14	6
Cincinnati	235,000	331	16.90	331	77	10	9	.....	10	1	3	1	24	5
Cleveland	181,000	159	18.83	76	51	2	35	5	2	1	3	1	1	1
Columbus	101,000	102	20.14	50	31	1	13	3	4	.....	.....	.....	.....	.....
Dayton	60,000	6	10.26	3	4	.....	.....	.....	.....	.....	.....	.....	.....	.....
Defiance	5,000	5	12.00	2	1	.....	1	.....	.....	.....	.....	.....	.....	.....
Delphos	1,800	3	20.00	1	2	1	.....	.....	.....	.....	.....	1	.....	.....
Dunkirk	10,000	11	13.20	7	1	5	.....	.....	.....	.....	.....	.....	.....	.....
East Liverpool	8,000	4	6.00	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Fostoria	2,000	3	18.00	1	1	.....	.....	.....	.....	.....	.....	.....	1	.....
Hamilton	20,000	26	15.10	7	7	1	6	.....	.....	.....	.....	.....	.....	.....
Higginsport	1,000	4	48.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ironton	12,000	25	25.00	18	7	.....	5	.....	2	.....	.....	.....	.....	.....
Lockland	3,000	5	20.00	5	2	1	.....	.....	.....	.....	.....	.....	.....	.....
Logan	3,700	4	12.97	1	1	.....	1	.....	.....	.....	.....	.....	.....	.....
McComb	1,700	3	21.18	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mansfield	15,000	18	14.40	5	4	.....	1	.....	.....	.....	.....	.....	.....	.....
Marion	1,700	10	15.00	4	3	.....	1	2	.....	.....	.....	.....	.....	.....
Middletown	8,200	10	14.63	4	2	.....	1	1	.....	.....	.....	.....	.....	.....
Nelsonville	5,000	5	12.00	2	2	.....	1	.....	.....	.....	.....	.....	.....	.....
New London	1,100	4	54.54	1	1	.....	.....	.....	.....	.....	.....	1	.....	.....
Painesville	5,000	6	16.80	.....	1	.....	.....	.....	.....	.....	1	.....	.....	.....
Piqua	10,000	12	14.40	3	2	.....	1	.....	.....	.....	.....	.....	.....	.....
Portsmouth	14,000	19	16.14	15	4	.....	.....	.....	.....	.....	1	.....	.....	.....
Salem	6,000	18	36.00	9	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sandusky	28,000	16	8.24	.....	5	2	.....	1	.....	.....	.....	1	.....	.....
Shawnee	3,000	5	20.00	5	4	.....	4	.....	.....	.....	.....	.....	.....	.....
Springfield	38,000	41	12.95	15	6	1	1	.....	.....	.....	1	.....	1	.....
Toledo	89,000	124	16.17	52	36	16	8	.....	5	.....	1	1	.....	.....
Tiffin	14,000	20	17.14	6	7	3	1	1	.....	.....	.....	.....	.....	.....
Troy	5,000	7	16.80	3	3	2	1	.....	.....	.....	.....	.....	.....	.....
Uhrichsville	4,300	5	13.95	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Urbana	8,000	12	18.00	3	3	.....	3	.....	.....	.....	.....	.....	.....	.....
Washington C. H.	7,500	6	9.00	.....	2	.....	.....	.....	.....	.....	1	.....	.....	.....
Waverly	1,600	4	30.00	1	3	.....	.....	.....	2	.....	.....	.....	.....	.....
Xenia	10,000	10	12.00	4	2	.....	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown	25,000	20	9.60	11	5	.....	3	.....	1	.....	.....	1	.....	.....
Zanesville	25,000	40	19.20	9	11	1	5	.....	3	.....	.....	.....	.....	.....
Totals	1,264,000	1,938	18.99	783	519	70	173	18	59	15	17	12	44	15

* Premature and still births excluded.

Bellefontaine reports 1 death from scarlet fever; Chicago 1 from cholera infantum, and 1 from phthisis pulmonalis; Clyde 1 from old age, and 1 from consumption; Garrettsville 1 from paralysis and 1 from heart disease; North Amherst 1 from meningitis; Oberlin 1 from malarial fever; Richwood 1 from rheumatism; Ravenna 1 from malarial fever, and 1 from heart disease; West Liberty 1 from illio-

FOLLOWING CITIES AND TOWNS OF OHIO, DURING THE MONTH OF JUNE, 1890.

Total constitutional diseases.	Cancer.	Phthisis, pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still-birth.	Authority.
2	2		8		1		1		2			3	2	2	6	Dr. L. S. Ebright, H. O.
1		1	3	1				1				1	1	1		Dr. James Bates, H. O.
1		1	1						1				3			Dr. A. W. Hopkins, H. O.
1		1	3						2	1			6			Dr. L. F. House, H. O.
1	1		1				1									Dr. J. Park West, H. O.
2													1		1	John Earls, H. O.
4		3	6				2			1		1	3			J. J. Pinkerton, H. O.
1		1	5						3			1	1			Dr. J. F. Marchand, H. O.
90	13	58	323	11	6	20	25	18	27	51		36	70	33	44	Dr. J. D. Miller, H. O.
43	5	28	170	5	10	12	32	13	15	20	1	29	33	26	53	Dr. J. W. Prendergast, H. O.
29	3	21	51	4	4	3	5	4	5	5		8	11	17	5	Dr. G. C. Ashmun, H. O.
20	3	9	36		3		4	3	1	4		3	12	3	9	Dr. Lee McBriar, H. O.
2		2														Dr. J. M. Weaver, H. O.
1		1	2		1		1						1			A. Berchtold, H. O.
1	1		1						1				1			C. P. Washburn, H. O.
1	1		2					1	2				1			Dr. C. C. McLaughlin, H. O.
1	1		1					1					1			Wm. Gibbs, H. O.
2		2	5						2	2		1	3			J. O. Hess, H. O.
4		2	12				1		1	2			2			Dr. R. D. Mussey, H. O.
2		1	1				1									Dr. Geo. Trebel, H. O.
2		1	1													P. J. Daum, H. O.
1		1	1													Dr. N. K. Moxley, Jr., H. O.
1		1	1													R. B. Latta, H. O.
1		1	1													Dr. I. C. Wright, H. O.
3		1	10			1		1	1				1	1		Dr. Jno. A. Thompson, H. O.
3		3	2	1	1								1	1		Dr. R. Harvey Reed, H. O.
3		3	4										1	1		J. K. Redd, H. O.
			2				1					1	1			Dr. G. D. Luminis, H. O.
			1									1	1			Dr. Chas. W. Cable, H. O.
1	1		2									1	2		1	Dr. N. O. Allen, H. O.
1	1		8				1					2				H. P. Sanford, C.P.K.
2		2	6	2					2			1	1			Dr. R. M. O'Ferrall, H. O.
5	1	4	12				2					5	5	2		Dr. C. C. Fulton, H. O.
2		1	7					1	2			1	2			Dr. T. T. Church, H. O.
			1													Dr. Elwood Stanley, H. O.
12	2	9	17	1	4	2	4			3			2	3	3	C. E. Whittington, H. O.
15	3	11	51	2	2	5	8	1	6	3		10	15	7	13	Dr. H. H. Seys, H. O.
3		2	4	1		1				1		1		2		Dr. G. A. Collamore, H. O.
2		2												2		Dr. J. Bridinger, H. O.
2		2											1	2		Dr. J. G. Senour, H. O.
1	1		5	1		1		1	2				2	1		Dr. J. E. Groves, H. O.
2		2	1										1			Dr. H. C. Houston, H. O.
1		1													2	J. M. Edwards, H. O.
3		3	5					1	3	1						Dr. Austin Hutt.
2	1	1	7		1		2	1	1			2	2	4	3	Dr. A. L. Dryden, H. O.
6	1	5	9					2		3		2	8	2	2	Dr. W. L. Buechner, H. O.
287	42	192	504	31	35	46	91	48	85	111	1	103	197	118	148	Dr. H. T. Sutton, H. O.

colitis; Versailles 2 from whooping cough; Union City 1 from cancer; West Milton 1 from pulmonary consumption, and 1 from drowning; West Unity 1 from heart disease; Mechanicsburg 1 from Bright's disease; Milford 1 from cholera infantum, and 1 from phthisis; Felicity 1 from old age, and 1 from consumption. Ashley, Cuyahoga Falls, Smithville and West Mentor report no deaths for June.

ABSTRACT OF REPORTS OF DEATHS AND CAUSES, IN THE FOLLOWING

Place and population. (estimated.)	Total deaths, all causes.*	Annual rate per 1,000.*	Total under five years.	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis.	Diarhoea.	Dysentery.	Measles.	Scarlet fever.	Typhoid fever.	Whooping cough.
Akron, 30,000.....	53	21.26	.....	22	.....	16	.....	1	.....	.....	.....	.....	2
Alliance, 10,000.....	20	24.00	9	6	.....	3	.....	1	.....	.....	.....	.....	.....
Ashtabula, 6,500.....	10	18.42	3	2	.....	2	.....	.....	.....	.....	.....	.....	.....
Ashley, 800.....	4	68.57	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bainbridge, 800.....	5	75.00	1	2	.....	2	.....	.....	.....	.....	.....	.....	.....
Bellaire, 12,000.....	14	14.00	8	2	.....	1	.....	1	.....	.....	.....	.....	.....
Bellevue, 3,500.....	4	13.71	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Berea, 2,500.....	9	43.20	4	3	.....	.....	.....	.....	.....	3	.....	.....	.....
Canton, 25,000.....	40	19.20	15	13	.....	6	.....	1	.....	.....	.....	5	.....
Chillicothe, 14,000.....	22	18.86	6	4	.....	1	.....	2	.....	.....	.....	1	.....
Cincinnati, 325,000.....	605	22.34	267	169	28	47	2	23	2	1	.....	23	.....
Cleveland, 235,000.....	414	21.14	207	158	4	37	.....	37	.....	1	1	11	1
Columbus, 101,000.....	131	15.56	59	33	3	16	2	4	2	.....	.....	2	.....
Conneaut, 1,500.....	5	20.00	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cuyahoga Falls, 3,500.....	5	17.14	4	3	2	.....	.....	.....	.....	.....	.....	.....	.....
Dayton, 60,000.....	114	22.80	54	37	6	16	2	2	2	.....	.....	2	.....
Defiance, 7,000.....	16	27.43	2	8	6	1	.....	.....	.....	.....	.....	1	.....
Delaware, 9,000.....	7	9.33	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Delphos, 5,000.....	7	9.80	4	1	.....	.....	.....	.....	.....	.....	.....	1	.....
Dunkirk, 1,800.....	3	20.00	2	2	.....	2	.....	.....	.....	.....	.....	.....	.....
East Liverpool, 10,000.....	12	14.40	5	5	.....	2	.....	1	.....	.....	.....	.....	.....
Felicity, 1,000.....	6	60.00	.....	3	.....	.....	.....	.....	.....	2	.....	.....	.....
Fostoria, 8,000.....	11	16.50	2	4	.....	3	.....	.....	.....	.....	.....	.....	.....
Fremont, 12,000.....	6	6.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Galion, 7,000.....	7	12.00	2	2	.....	2	.....	.....	.....	.....	.....	.....	.....
Hamilton, 20,000.....	31	18.60	10	6	1	3	.....	1	1	.....	.....	.....	.....
Higginsport, 1,000.....	3	36.00	.....	2	.....	.....	.....	.....	.....	.....	.....	1	.....
Hudson, 1,800.....	3	22.50	1	1	.....	1	.....	.....	.....	.....	.....	.....	.....
Ironton, 12,000.....	26	26.00	11	7	.....	2	.....	1	.....	.....	.....	2	.....
Lancaster, 8,000.....	16	24.00	4	8	.....	8	.....	.....	.....	.....	.....	.....	.....
Lockland, 3,000.....	6	24.00	2	1	.....	1	.....	.....	.....	.....	.....	.....	.....
Logan, 3,700.....	2	6.48	.....	1	.....	.....	.....	1	.....	.....	.....	.....	.....
Mansfield, 15,000.....	16	12.80	8	7	.....	7	.....	.....	.....	.....	.....	.....	.....
Marion, 8,000.....	11	16.50	6	6	.....	6	.....	.....	.....	.....	.....	.....	.....
Mechanicsburg, 2,000.....	4	24.00	2	2	.....	1	.....	.....	.....	.....	.....	.....	.....
Middletown, 8,200.....	17	24.88	12	3	.....	.....	.....	1	2	.....	.....	.....	.....
Nelsonville, 5,000.....	6	14.40	4	3	.....	2	.....	.....	.....	.....	.....	.....	.....
New Straitsville, 3,000.....	4	16.00	.....	4	.....	.....	.....	2	.....	.....	2	.....	.....
North Amherst, 1,600.....	4	30.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Oberlin, 4,000.....	4	12.00	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Painesville, 5,000.....	9	21.60	2	1	.....	1	.....	.....	.....	.....	.....	.....	.....
Piqua, 10,000.....	14	16.80	3	1	.....	1	.....	.....	.....	.....	.....	.....	.....
Portsmouth, 14,000.....	25	21.43	7	8	.....	2	.....	3	2	.....	.....	1	.....
Ravenna, 5,000.....	7	16.80	.....	5	.....	3	.....	.....	.....	.....	.....	.....	.....
Reading, 3,000.....	9	36.00	.....	3	.....	2	.....	1	.....	.....	.....	.....	.....
Richwood, 2,000.....	5	30.00	.....	3	.....	2	.....	.....	.....	.....	.....	1	.....
Sabina, 1,500.....	2	16.00	1	1	.....	.....	.....	1	.....	.....	.....	.....	.....
Salem, 6,000.....	15	30.00	6	5	.....	1	.....	1	.....	.....	.....	1	.....
Sandusky, 23,000.....	12	6.26	5	5	.....	3	.....	.....	.....	.....	.....	1	.....
Shawnee, 3,000.....	5	20.00	5	5	.....	5	.....	.....	.....	.....	.....	.....	.....
Shelby, 2,500.....	3	12.86	1	1	.....	1	.....	.....	.....	.....	.....	.....	.....
South Charleston, 1,200.....	4	40.00	.....	2	.....	1	.....	.....	.....	.....	.....	.....	.....
Springfield, 38,000.....	57	12.74	26	24	.....	15	.....	2	.....	.....	.....	2	.....
Tiffin, 14,000.....	14	12.00	6	6	2	3	.....	.....	.....	.....	.....	1	.....
Toledo, 89,000.....	126	18.58	72	62	10	28	.....	12	1	.....	1	3	.....
Uhrichsville, 4,300.....	3	8.37	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Urbana, 8,000.....	10	15.00	5	4	.....	3	.....	1	.....	.....	.....	.....	.....
Washington C. H., 7,500.....	10	16.00	5	4	.....	3	.....	.....	.....	.....	.....	.....	.....
Waverly, 1,600.....	5	37.50	2	3	.....	1	.....	.....	1	.....	.....	.....	.....
West Salem, 900.....	4	53.33	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Wooster, 8,500.....	7	9.88	1	4	.....	1	.....	.....	1	.....	.....	.....	.....
Youngstown, 25,000.....	51	24.48	22	22	.....	17	.....	.....	2	.....	.....	2	.....
Zanesville, 25,000.....	31	14.88	11	13	.....	9	.....	.....	.....	.....	.....	.....	.....
Totals: population.....1,301,300	2,135	19.63	913	725	62	293	7	87	32	9	4	61	3

*Premature and still births excluded.

Bedford reports 1 death; Carthage 1 from cerebro-spinal meningitis, Celina 1 from cholera infantum and 1 from violence, Clyde 1 from hemorrhage of the kidneys and 1 from consumption Glendale 1 from cholera infantum and 1 from shock, Kent 1 cholera infantum and 1 from convulsions, Leesville X Roads 1 from consumption, Mentor 1 from consumption and 1 from old age,

CITIES AND TOWNS OF OHIO, DURING THE MONTH OF JULY, 1890.

Total constitutional diseases.	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Menigitis.	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still-born.	Authority.
6	3	1	20	1	.....	.....	4	.....	1	.....	.....	4	1	1	1	Dr. L. S. Ebright, H. O.
2	1	1	2	1	.....	.....	.....	.....	.....	.....	.....	1	9	1	.....	Dr. James Bates, H. O.
4	1	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	3	.....	Dr. A. W. Hopkins, H. O.
.....	.....	.....	2	1	.....	.....	.....	.....	.....	.....	.....	1	1	.....	.....	J. Harroun, H. O.
1	.....	1	2	.....	.....	.....	.....	2	.....	.....	.....	.....	.....	2	1	Dr. L. F. House, H. O.
.....	.....	.....	8	2	1	1	.....	.....	1	3	.....	.....	2	2	1	Dr. J. Park West, H. O.
.....	.....	.....	2	1	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	John Earls, H. O.
.....	.....	.....	4	.....	1	.....	2	.....	1	.....	.....	.....	3	.....	.....	T. G. Carl, Sec'y.
4	.....	4	17	1	2	.....	2	.....	1	1	3	.....	4	2	.....	Dr. J. F. Marchand, H. O.
5	2	3	7	.....	.....	.....	3	1	1	.....	.....	.....	3	2	.....	Dr. J. D. Miller, H. O.
81	12	51	215	6	7	13	25	12	26	24	.....	21	71	38	38	Dr. J. W. Prendergast, H. O.
50	11	27	155	5	7	8	30	9	13	30	1	17	16	26	33	Dr. G. C. Ashmun, H. O.
14	3	11	44	3	1	7	6	9	5	8	.....	5	9	6	8	Dr. Lee McBriar, H. O.
1	.....	1	2	.....	.....	.....	1	.....	.....	.....	.....	1	1	1	.....	Dr. E. D. Merriam, H. O.
1	1	1	1	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	Dr. J. D. Dodge.
18	2	10	47	.....	1	1	5	3	2	4	.....	3	9	3	7	Dr. J. M. Weaver, H. O.
1	.....	1	5	1	.....	.....	1	1	1	.....	.....	.....	2	.....	.....	Dr. A. Berchtold, H. O.
2	2	.....	3	.....	.....	.....	1	.....	1	.....	.....	.....	.....	.....	.....	Dr. J. W. N. Vogt, H. O.
2	1	1	4	.....	.....	.....	4	.....	.....	.....	.....	.....	.....	.....	.....	C. P. Washburn, H. O.
1	1	.....	1	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	2	.....	Dr. C. C. McLaughlin, H. O.
1	.....	1	6	1	.....	.....	.....	.....	2	.....	.....	1	.....	2	2	Wm. Gibbs, H. O.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5	.....	.....	C. E. Houghton, H. O.
3	1	2	1	.....	.....	.....	.....	.....	.....	.....	.....	1	1	.....	.....	J. O. Hess, H. O.
5	.....	5	7	1	.....	.....	.....	.....	1	.....	.....	1	1	.....	.....	Dr. F. S. Hillbish, H. O.
.....	.....	.....	1	.....	1	.....	.....	.....	2	1	.....	.....	3	1	.....	Dr. Webb J. Kelly, H. O.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Dr. Geo. Trebel, H. O.
4	.....	4	10	.....	.....	.....	.....	.....	2	1	.....	.....	1	.....	.....	Philip J. Daum, H. O.
4	2	2	2	.....	.....	.....	.....	.....	1	.....	.....	1	2	.....	1	Dr. F. Hodge, H. O.
1	1	1	4	.....	.....	.....	.....	2	1	.....	.....	.....	.....	.....	.....	Dr. N. K. Moxley, Jr., H. O.
2	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	Dr. J. W. Lewis, H. O.
2	.....	2	5	.....	.....	.....	1	.....	1	.....	.....	1	1	1	.....	R. E. Latta, H. O.
2	2	3	2	.....	.....	.....	.....	1	1	.....	.....	1	1	.....	.....	Dr. I. C. Wright, H. O.
3	1	2	9	.....	.....	.....	.....	.....	.....	3	.....	1	1	.....	.....	Dr. R. Harvey Reed, H. O.
.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	E. J. Raffensperger, H. O.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Dr. O. A. Ninscheiser, H. O.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Dr. G. D. Lummis, H. O.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	Dr. Chas. W. Cable, H. O.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Barney Davis, H. O.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Dr. W. H. Cornwell, H. O.
1	1	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	T. R. Mayhew, H. O.
1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	H. P. Sanford, Clerk.
7	3	2	3	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	Dr. R. M. O'Ferrall, H. O.
3	1	2	7	1	1	.....	1	.....	1	.....	.....	1	3	4	.....	Dr. C. C. Fulton, H. O.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	Joseph Gledhill, H. O.
.....	.....	.....	5	.....	1	.....	2	.....	1	.....	.....	.....	.....	.....	.....	F. X. Ankenbauer, H. O.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	Dr. J. Oatley, H. O.
1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3	Dr. A. J. Gaskins, H. O.
1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Dr. T. T. Church, H. O.
1	1	.....	5	1	1	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	Dr. Elwood Stanley, H. O.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	C. E. Whittington, Clerk.
1	.....	1	1	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	Dr. M. T. Love, H. O.
1	.....	1	1	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	Dr. M. H. Collins, H. O.
6	1	5	18	1	.....	.....	4	.....	2	2	.....	.....	6	3	5	Dr. H. H. Seys, H. O.
2	.....	1	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Dr. J. Bridinger, H. O.
12	.....	10	29	1	.....	3	3	.....	4	2	.....	3	14	9	15	Dr. G. A. Collamore, H. O.
1	1	.....	2	.....	.....	.....	1	.....	1	.....	.....	.....	.....	.....	.....	Dr. J. E. Groves, H. O.
1	.....	1	4	1	.....	.....	.....	.....	1	2	.....	.....	.....	.....	1	Dr. H. C. Houston, H. O.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5	.....	J. M. Edwards, H. O.
2	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Dr. Austin Hunt.
2	.....	2	1	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	B. M. McCauley, H. O.
2	.....	2	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Dr. J. M. Barrett, H. O.
5	1	3	15	.....	3	.....	1	4	2	2	1	1	6	3	2	Dr. W. L. Buechner, H. O.
3	1	2	11	.....	2	.....	1	.....	1	.....	.....	.....	.....	.....	.....	Dr. H. T. Sutton, H. O.
286	57	177	738	37	30	33	103	47	81	89	3	66	198	122	132	

Smithville 1 from dysentery, New Bremen 1 from cerebro spinal meningitis and 1 from old age, New London 1 from dropsy, Union City 1 from apoplexia and 1 from meningitis, West Liberty 1 from dysentery and 1 premature birth, West Milton 1 from cholera infantum and 1 from dysentery, Versailles 1 from heart disease and 1 from inanition. Milford, Garrettsville and Springboro report no deaths for July.

ABSTRACT OF REPORTS OF DEATHS AND CAUSES, IN THE FOLLOWING

Place and population (estimated).	Total deaths, all causes.*	Annual rate per 1,000.*	Total under five years.	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis.	Diarrhoea.	Dysentery.	Measles.	Scarlet fever.	Typhoid fever.	Whooping cough.
Akron, 20,000.....	59	23.60	39	36		15		2	3				11
Alliance, 10,000.....	10	12.00	6	6							1		
Ashtabula, 6,500.....	15	27.68	9	10		9							
Bainbridge, 800.....	6	90.00		6		3			1			2	
Bellaire, 12,000.....	12	12.00	1	4	1			1				2	
Bellevue, 3,500.....	4	13.71	5										
Berea, 2,500.....	7	23.60	1										
Chicago, 1,100.....	3	32.73		5	1	4							
Chillicothe, 14,000.....	13	11.14	3	1					1		1		1
Cincinnati, 325,000.....	466	17.21	154	135	33	22	1	10	6			24	2
Cleveland, 235,000.....	541	27.62	266	217	10	108	1	59	2	1		30	3
Columbus, 101,000.....	119	14.14	41	20	8							7	
Conneaut, 1,500.....	5	40.00	1	3		2							
Clyde, 3,000.....	4	13.71	1	2					2				
Cuyahoga Falls, 3,500.....	6	20.57	2	3		1							2
Crestline, 3,300.....	7	25.45	1	3		1							
Dayton, 60,000.....	71	14.20	31	18	3	10						1	
Defiance, 7,000.....	17	29.14	6	12	6		1					2	
Delaware, 9,000.....	9	12.60	3	2								2	
Delphos, 5,000.....	6	14.00											
Dunkirk, 1,800.....	7	46.67	2	4		2							
East Liverpool, 10,000.....	10	12.00	4	5		1		1				2	
Fostoria, 5,000.....	9	13.55		4	1	3							
Fremont, 12,000.....	6	6.00	3	2		2							
Galion, 7,000.....	7	12.00		6		3						2	
Geneva, 3,000.....	6	24.00		4	3				1				
Hamilton, 20,000.....	18	10.50	6	5	2	1						1	
Higginsport, 1,000.....	3	36.00	1	1				1					
Hudson, 1,800.....	3	20.00	2										
Ironton, 12,000.....	15	15.00	5	2			1					1	
Kent, 4,100.....	3	8.78	2	3									
Lancaster, 8,000.....	7	10.50	4	4		3		1					
Leetonia, 4,000.....	4	12.00		2				1					
Leesville X Roads, 200.....	3	180.00		1		1						1	
Logan, 3,700.....	7	22.70	4	1		1							
McComb, 1,700.....	3	21.17	3	1		1							
Mansfield, 15,000.....	13	10.40	6	3		3							
Marion, 8,000.....	14	21.00		12		7						5	
Middletown, 8,200.....	9	13.70	5	2								1	
Millersburg, 2,500.....	6	28.50		1		1						1	
Minster, 1,200.....	4	40.00	2	1									
Nelsonville, 5,000.....	10	24.00	5	4		2		1					
New Lisbon, 2,800.....	4	17.14	1	1								1	
New Straitsville, 3,000.....	4	16.00	1	1		1							
North Amherst, 1,600.....	5	37.50	1	1		1							
Oberlin, 4,000.....	6	18.00	2	4		2						1	
Piqua, 10,000.....	8	9.60											
Portsmouth, 14,000.....	17	14.57	7	5				2					
Ravenna, 5,000.....	4	9.60		2		1							
Reading, 3,000.....	4	16.00	3	1	1								
Sabina, 1,500.....	6	48.00						1					
St. Paris, 1,800.....	4	26.66	2	2		2							
Salem, 6,000.....	11	22.00	6	5		3			1				
Sandusky, 23,000.....	15	7.83		9		6			1			1	
Shawnee, 3,000.....	3	12.00		1		1							
Shelby, 2,500.....	3	14.40	2										
Sidney, 5,100.....	8	18.82	2	5		2						3	
South Charleston, 1,200.....	5	50.00		3		1			1				
Springfield, 38,000.....	43	13.53	15	8		4						3	
Tiffin, 14,000.....	18	15.43		7	2	5							

CITIES AND TOWNS OF OHIO, DURING THE MONTH OF AUGUST, 1890.

Total constitutional diseases.	Cancer.	Phthisis, pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still-born.	Authority.
4	4	7	1	1						1		4	5	3	2	Dr. L. S. Ebright, H. O.
		3						1	2			1	1	1	1	Dr. James Bates, H. O.
		3		3										2		Dr. A. W. Hopkins, H. O.
1	1	5					1	1	1	1			2			Dr. L. F. House, H. O.
1		1										1	1			Dr. J. Park West, H. O.
1	1	1										1	1			John Earls, H. O.
1	1	1		1												T. C. Card, Secretary.
3	1	5	1	1						1				1	3	Dr. D. H. Young, H. O.
85	13	43	176	12	9	9	5	11	19	15	1	21	37	33	7	Dr. J. F. Miller, H. O.
84	14	37	169	2	1	10	48	13	15	21	2	13	43	28	49	Dr. J. W. Prendergast, H. O.
16	3	12	51	2	1	5	7	13	9	6		8	7	10	10	Dr. G. C. Ashmun, H. O.
																Dr. Lee McBriar, H. O.
																Dr. E. D. Merriam, H. O.
																Alex. Harnden, H. O.
1	1	1														Dr. J. D. Dodge, H. O.
1	1	1														Dr. G. R. Edwards, H. O.
11	3	6	28	1	3		1	1	5	2		1	1	1	10	Dr. J. M. Weaver, H. O.
2	1	1	2				1							1	1	Dr. A. Berchold, H. O.
3		3	1										3			Dr. J. W. N. Vogt, H. O.
1	1	1	3	1	1					1			1	1		C. P. Washburn, H. O.
1	1	1														Dr. C. C. McLaughlin, H. O.
2	1		3									2	2			Wm Gibbs, H. O.
			3													J. O. Hess, H. O.
			2				2							1	1	Dr. F. S. Hillbush, H. O.
1	1															Dr. Webb J. Kelly, H. O.
1	1		1													G. W. Foster, H. O.
3	1	2	5				1	1	1	2			1	1	1	Dr. Geo. Trebel, H. O.
1	1	1	1		1											Philip J. Baum, H. O.
1	1	1	1							1			1			Dr. F. Hodge, H. O.
4	4	6						1				2	2	1		Dr. N. K. Moxley, Jr., H. O.
					1					2						Dr. J. P. Holcomb, H. O.
1	1	1														Dr. J. W. Lewis, H. O.
												1	1		1	Dr. S. R. McCready, H. O.
4	3															Dr. C. E. Trimble, H. O.
																Dr. I. C. Wright, H. O.
2	1		7	1	1	1						1	1		3	Dr. Jno. A. Thompson, H. O.
							1							1		Dr. R. Harvey Reed, H. O.
																E. J. Ruffensperger, H. O.
3	2	3					1			1			1		1	Dr. G. D. Lummis, H. O.
																Dr. J. E. Whitmar, H. O.
																Dr. R. A. Rulmann, H. O.
1	1	5					1		2			1				Dr. Chas. W. Cable, H. O.
																John Cavanaugh, H. O.
2	1	1								1				2		Barney Davis, H. O.
3		3														Dr. W. H. Cornwell, H. O.
2		2														T. R. Mayhew, H. O.
4	1	3								1						Dr. R. M. O'Ferrall, H. O.
5	1	4	5	1					2							Dr. C. C. Fulton, H. O.
1	1											1				Joseph Gledhill, H. O.
															2	F. X. Ankenbauer, H. O.
3	3	1												1		Dr. A. J. Gaskins, H. O.
2	1															Dr. C. A. Offenbacher, H. O.
																Dr. T. T. Church, H. O.
1										1						Dr. Elwood Stanley, H. O.
														2		C. E. Whittington, Clerk.
												1	1			Dr. M. T. Love, H. O.
2	2												1			Dr. Edwin LeFevre, H. O.
									1							Dr. M. H. Collins, H. O.
10	2	8	16	3	2		3			2		1	5	3	1	Dr. H. H. Seys, H. O.
4	4	6	1	1				3					1	1		Dr. J. Bridinger, H. O.

ABSTRACT OF REPORTS OF DEATHS AND CAUSES, IN THE FOLLOWING CITIES

Place and population (estimated).	Total deaths, all causes.*	Annual rate per 1,000.*	Total under five years.	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis.	Diarrhea.	Dysentery.	Measles.	Scarlet fever.	Typhoid fever.	Whooping cough.
Toledo, 81,650.....	102	14.99	47	34	2	12	.....	8	1	.....	.....	5	3
Union City, 1,500.....	5	46.66	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....
Urbana, 8,000.....	16	24.00	4	7	.....	3	1	.....	2	.....	.....	.....	.....
Washington C. H., 7,500.....	5	8.00	4	2	.....	1	.....	.....	.....	.....	.....	.....	1
Waverly, 1,600.....	4	30.00	2	2	.....	.....	.....	.....	.....	.....	.....	.....	.....
Wooster, 8,500.....	13	18.35	.....	7	1	3	.....	.....	.....	.....	.....	1	.....
Xenia, 9,000.....	6	8.00	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown, 25,000.....	41	19.68	25	25	.....	15	.....	.....	.....	.....	.....	4	1
Zanesville, 25,000.....	29	13.92	2	9	.....	2	1	.....	1	.....	.....	.....	5
Totals: population, 1,318,100	1,958	17.91	760	696	77	260	7	67	26	2	2	107	29

* Premature and still-births excluded.

Ashley reports 1 death from tumor; Carthage 1 from tonsillitis; Clifton 1 from cholera infantum and 1 from inanition; Dalton 1 from cancer; East Palestine 1 from pneumonia; Garrettsville 1 from laryngitis and 1 from enteritis; Glendale 1 from typhoid fever; Lockland 1 from diphtheria and 1 from convulsions; New Bremen 1 from gastritis; New Lexington 1 from phthisis pulmonalis

AND TOWNS OF OHIO, DURING THE MONTH OF AUGUST, 1890—Concluded.

Total constitutional diseases.	Cancer.	Phthisis, pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still-born.	Authority.
13	2	9	38	2	2	2	8	3	5	2	.....	2	12	5	14	Dr. G. A. Collamore, H. O.
4	2	2	3	.....	1	.....	.....	.....	.....	.....	.....	.....	4	.....	1	Dr. W. M. Grimes, H. O.
.....	.....	.....	1	.....	.....	1	.....	.....	.....	.....	.....	1	1	.....	1	Dr. H. C. Houston, H. O.
.....	.....	.....	1	.....	.....	.....	.....	.....	1	.....	.....	1	1	.....	.....	J. M. Edwards, H. O.
3	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	1	1	.....	.....	Dr. Austin Hutt.
1	.....	.....	1	.....	.....	.....	.....	.....	1	1	.....	2	.....	.....	.....	Dr. J. M. Barrett, H. O.
12	.....	.....	13	.....	.....	1	.....	3	3	1	.....	2	1	.....	1	Dr. A. D. DeHaven, H. O.
6	.....	4	7	1	.....	.....	1	2	.....	.....	.....	1	4	3	3	Dr. W. L. Buechner, H. O.
15	52	179	523	30	34	29	85	54	73	63	3	69	182	101	123	Dr. H. T. Sutton, H. O.

and 1 from tubercular meningitis; New London 1 from erysipelas; Painesville 1 from Bright's disease and 1 from heart disease; Smithville 1 from gastritis; Uhrichsville 1 from typhoid fever and 1 from inanition; West Milton 1 death; West Salem 1 from gastritis. Ada, Felicity, Mechanicsburg Springboro, Versailles and West Liberty report no deaths for August.

ABSTRACT OF REPORTS OF DEATHS AND CAUSES, IN THE FOLLOWING

Place and population (estimated).	Total deaths, all causes. ^a	Annual rate per 1,000. ^a	Total under five years.	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis.	Diarrhoea.	Dysentery.	Measles.	Scarlet fever.	Typhoid fever.	Whooping cough.
Akron, 30,000.....	16	6.20	.....	9	1	1	.....	.....	.....	.....	.....	.....	1
Alliance, 10,000.....	11	12.10	.....	3	1	.....	.....	.....	.....	1	.....	.....	.....
Ashtabula, 6,500.....	8	14.12	.....	3	.....	1	.....	.....	.....	.....	.....	1	.....
Bellaire, 12,000.....	9	10.00	.....	3	1	.....	.....	.....	.....	.....	.....	1	.....
Bellefontaine, 5,000.....	3	7.20	.....	2	.....	1	.....	1	.....	.....	.....	.....	.....
Berea, 2,500.....	3	14.40	.....	2	1	.....	.....	.....	.....	.....	.....	1	.....
Canton, 25,000.....	40	19.20	9	13	.....	2	.....	.....	.....	.....	.....	9	.....
Carthage, 1,500.....	3	18.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Chillicothe, 14,000.....	26	29.43	8	6	1	2	.....	.....	.....	.....	.....	3	.....
Cincinnati, 325,000.....	428	17.63	143	101	35	8	2	9	4	.....	1	21	.....
Cleveland, 235,000.....	331	16.94	112	114	20	35	.....	15	1	.....	3	19	2
Clyde, 3,000.....	5	20.00	3	2	.....	1	.....	.....	.....	.....	.....	.....	.....
Columbus, 161,000.....	97	19.44	34	30	1	8	2	3	1	.....	1	14	.....
Conneaut, 1,500.....	3	21.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Crestline, 3,300.....	3	10.91	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cuyahoga Falls, 3,500.....	6	20.57	4	.....	1	.....	.....	.....	.....	1	.....	.....	.....
Dayton, 60,000.....	80	16.00	23	22	14	.....	2	1	.....	.....	.....	.....	1
Defiance, 7,000.....	3	12.00	1	2	.....	.....	.....	.....	.....	.....	.....	.....	.....
Delphos, 5,000.....	3	7.20	.....	1	2	.....	.....	.....	.....	.....	.....	.....	.....
Dunkirk, 1,800.....	3	20.00	1	3	2	.....	.....	.....	.....	.....	.....	.....	.....
East Liverpool, 10,000.....	12	14.40	3	8	2	2	.....	1	.....	.....	.....	1	.....
Fostoria, 8,000.....	5	7.50	3	3	.....	.....	.....	.....	.....	.....	.....	1	.....
Fremont, 12,000.....	10	10.00	5	3	3	.....	.....	.....	.....	.....	.....	1	.....
Galion, 7,000.....	4	6.86	.....	1	.....	.....	.....	.....	.....	.....	.....	1	.....
Geneva, 3,000.....	7	28.00	.....	2	.....	.....	.....	.....	1	.....	.....	.....	.....
Hamilton, 20,000.....	24	14.40	8	4	2	.....	1	.....	1	.....	.....	.....	.....
Ironton, 12,000.....	10	12.00	2	3	1	.....	.....	.....	.....	1	.....	1	.....
Kent, 4,100.....	7	20.49	1	2	.....	.....	.....	.....	.....	.....	.....	1	.....
Lancaster, 8,000.....	6	9.00	3	3	1	1	.....	.....	.....	.....	.....	.....	.....
Leetonia, 4,000.....	6	18.00	4	2	1	1	.....	.....	.....	.....	.....	.....	.....
Logan, 3,700.....	5	16.21	1	3	.....	1	.....	2	.....	.....	.....	.....	.....
Mansfield, 15,000.....	10	8.60	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Marion, 8,000.....	6	9.00	4	3	.....	2	.....	.....	.....	.....	.....	1	.....
Middletown, 8,200.....	10	14.63	4	2	.....	1	.....	.....	.....	.....	.....	.....	.....
Nelsonville, 5,000.....	6	14.40	2	3	1	.....	.....	1	.....	.....	.....	1	.....
New Lisbon, 2,800.....	6	25.71	.....	3	.....	1	.....	.....	1	.....	.....	2	.....
Painesville, 5,000.....	9	21.60	.....	1	.....	.....	.....	.....	.....	.....	.....	1	.....
Piqua, 10,000.....	10	12.00	1	3	1	.....	.....	.....	.....	.....	.....	2	.....
Portsmouth, 14,000.....	16	13.71	7	5	3	.....	1	.....	.....	.....	.....	1	.....
Ravenna, 5,000.....	6	14.40	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Reading, 3,000.....	6	24.00	5	2	.....	1	.....	1	.....	.....	.....	.....	.....
Sabina, 1,500.....	6	48.00	.....	3	.....	1	.....	1	.....	.....	.....	1	.....
St. Paris, 1,800.....	3	20.00	1	1	.....	.....	.....	.....	.....	.....	.....	1	.....
Salem, 6,000.....	7	14.00	1	4	.....	.....	.....	1	1	.....	.....	2	.....
Sandusky, 23,000.....	14	6.72	.....	5	3	.....	.....	.....	.....	.....	.....	.....	1
Sidney, 5,100.....	3	7.06	3	1	.....	.....	.....	.....	.....	.....	.....	.....	1
Springfield, 38,000.....	40	12.89	8	15	1	2	.....	.....	.....	.....	.....	8	.....
Tiffin, 14,000.....	19	16.29	.....	12	8	3	.....	.....	.....	.....	.....	1	.....
Toledo, 81,650.....	114	16.75	44	30	10	8	.....	4	.....	.....	.....	4	.....
Uhrichsville, 4,300.....	8	22.32	.....	6	.....	1	.....	.....	.....	.....	.....	5	.....
Urbana, 8,000.....	10	15.00	2	2	.....	1	.....	.....	.....	.....	.....	.....	.....
Washington C. H., 7,500.....	5	8.00	3	1	.....	.....	.....	1	.....	.....	.....	.....	.....
Waverly, 1,600.....	5	37.50	1	2	.....	.....	.....	.....	.....	.....	.....	1	.....
Wooster, 8,500.....	9	12.71	.....	2	.....	.....	.....	.....	.....	.....	.....	2	.....
Xenia, 9,000.....	8	10.64	5	2	.....	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown, 25,000.....	30	14.40	22	18	2	7	.....	3	1	.....	2	3	.....
Zanesville, 25,000.....	30	14.40	13	7	.....	2	.....	.....	.....	.....	.....	5	.....
Totals: population, 1,305,150.....	1,614	14.99	506	493	115	104	7	42	12	3	7	117	6

^a Premature and still-births excluded.

Bellevue reports 1 death from phthisis pulmonalis and 1 from violence; Clifton 1 from consumption; East Palestine 2 from diphtheria; Elmwood Place 1 from goiter and 1 from hydrocephalus; Forest 1 from cancer; Garretttsville 1 from paresis and 1 from violence; Higginsport 1 death (cause not given); Hudson 1 from cholera infantum; Huron 1 from consumption and 1 still-birth; McComb 1 from meningitis; Mechanicsburg 1 from convulsions; Mentor 1 from malarial fever and 1 from heart disease; Lockland 1 from consumption and 1 from violence; Millersburg 1 from

CITIES AND TOWNS OF OHIO, DURING THE MONTH OF SEPTEMBER, 1890.

Total constitutional diseases.	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still-born.	Authority.
2		2	3		2								1	1		Dr. L. S. Ebright, H. O.
2		2	5						2			2	3	1		Dr. James Bates, H. O.
2		2	3	2				1					1			Dr. A. W. Hopkins, H. O.
3		3	4				1			1		2	1	1	1	Dr. J. Park West, H. O.
												1	1			Dr. C. W. Heffner, Secretary.
6	3	2	1	1	1		4		2	1		1	3	3		T. C. Card, Secretary.
1		1	1													Dr. J. F. Marchand, H. O.
3		3	14				1		5			1	3			Harry Ross, H. O.
67	12	36	192	12	6	10	10	11	22	15		18	30	38		Dr. J. F. Miller, H. O.
48	4	31	129	6	7	10	39	9	15	7	1	13	13	27	36	Dr. J. W. Prendergast, H. O.
													1			Dr. G. C. Ashmun, H. O.
18	3	15	36		3	1	7	3	5	5		6	4	7	7	Alex. Harnden, H. O.
1		1											1	1		Dr. Lee McBrier, H. O.
1	1		1										1	1		Dr. E. D. Merriam, H. O.
													1		1	Dr. G. R. Edwards, H. O.
14	1	10	24	1			1	1	3			2	1			Dr. J. D. Dodge
2	1	1	2									1		1	1	Dr. J. M. Weaver, H. O.
1		1	1	1								1		1		Dr. A. Berchtold, H. O.
																C. P. Washburn, H. O.
			1										1			Dr. C. C. McLaughlin, H. O.
													1	2	2	Wm. Gibbs, H. O.
2	2	3		1								1	2			J. O. Hess, H. O.
														1		Dr. F. S. Hillbush, H. O.
2		1	3		1			1								Dr. Webb I. Kelley, H. O.
4		4	11	2					1	2		1	4	1	3	Dr. G. W. Foster, H. O.
2		2	4	2									1			Dr. George Trebel, H. O.
1	1		1									1	1	2		Dr. N. K. Moxley, Jr., H. O.
3		3													1	Dr. J. P. Holcomb, H. O.
			2				1					1	2			Dr. J. W. Lewis, H. O.
			1						1					1		Dr. S. R. McCready, H. O.
1	1		6									1	1			Dr. I. C. Wright, H. O.
1		1	1						1					1		Dr. R. Harvey Reed, H. O.
1		1	5		1				1	1		2	1	1	2	J. K. Redd, H. O.
1		1	2													Dr. G. D. Lummis, H. O.
1		1	2						1							Dr. Chas. W. Cable, H. O.
3	2	1	5	2				1				2	2			John Cavanaugh, H. O.
2		2	3										1	1	1	H. P. Sanford, Clerk.
5	2	3	4	1	1			1				1	2			Dr. R. M. O'Ferrall, H. O.
2	1	1	2						2					1		Dr. C. C. Fulton, H. O.
			4												6	Joseph Gledhill, H. O.
2		2											1			F. X. Ankenbauer, H. O.
1		1	1				1							1		Dr. A. J. Gaskins, H. O.
			9										1	1		Dr. C. A. Offenbacher, H. O.
			2												2	Dr. T. T. Church, H. O.
5		4	14					1	3	2		1	3	3	1	Dr. Elwood Stanley, H. O.
3	1	2			2											Dr. Edwin LeFevre, H. O.
16	3	10	43	2	1	4	5	2	6	1		3	17	8	7	Dr. H. H. Seys, H. O.
			1						1				1			Dr. J. Bridger, H. O.
4		3	2			1							2			Dr. G. A. Collamore, H. O.
1		1	2	1		1							1			Dr. J. E. Groves, H. O.
1		1	1			1							1			Dr. H. C. Houston, H. O.
3	1	2	3		1							2				J. M. Edwards, H. O.
5	2	3								1			3	1	4	Dr. Austin Hutt.
6		6	9						2	2	1		4	4		Dr. J. M. Barrett, H. O.
257	43	171	609	33	34	26	76	34	80	42	2	66	138	123	83	Dr. A. D. DeHaven, H. O.
																Dr. W. L. Baechner, H. C.
																Dr. H. T. Sutton, H. O.

cholera infantum and 1 from meningitis; New Bremen 1 from old age; New Straltsville 1 from typhoid fever, 2 from cancer and 1 from heart disease; Oberlin 1 from puerperal fever and 1 from paralysis; Richwood 1 from convulsions; Shawnee 1 from malarial fever and 1 from convulsions; Shelby 1 from abscess of brain and 1 from meningitis; South Charleston 1 from violence; Springboro 1 from typhoid fever and 1 from consumption; Union City 1 from paralysis, and West Liberty 1 from cancer.

No deaths reported in Ashley, Bedford, Bainbridge, Minster and Versailles.

ABSTRACT OF REPORTS OF DEATHS AND CAUSES, IN THE FOLLOWING

Place and population (estimated.)	Total deaths, all causes.*	Annual rate per 1,000.*	Total under five years.	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis.	Diarrhea.	Dysentery.	Measles.	Scarlet fever.	Typhoid fever.	Whooping cough.
Akron, 30,000.....	42	16.80	16	11	4	1		1	1				1
Alliance, 10,000.....	13	15.60	4	3	1						1	1	
Ashtabula, 6,500.....	8	14.77	2	3		1						2	
Bellaire, 12,000.....	12	12.00	4	1				1					
Bellevue, 3,500.....	4	13.71											
Canton, 25,000.....	26	12.48	3	7	1							6	
Carthage, 1,500.....	3	24.00		2	2								
Celina, 2,200.....	3	16.36	2										
Chillicothe, 14,000.....	15	12.86	2	3	2							1	
Cincinnati, 325,000.....	470	17.35	139	91	35	3	1	8	1		1	24	
Cleveland, 235,000.....	372	14.91	132	116	45	27	5	4			4	21	1
Columbus, 101,000.....	112	13.37	30	31	8	3		1	1			17	
Cuyaboga Falls, 3,500.....	4	13.71											
Dayton, 60,000.....	86	17.03	34	29	23			1				2	
Defiance, 7,000.....	12	20.57		6	3							1	
Delaware, 9,000.....	3	4.00											
Delphos, 5,000.....	3	7.10	1										
Dunkirk, 1,800.....	3	20.00											
East Liverpool, 10,000.....	9	10.80	3	3	1							1	
East Palestine, 1,700.....	5	35.29		4	3							1	
Forest, 1,300.....	3	24.00		2	2								
Fostoria, 8,000.....	8	12.00	3	2	1								
Fremont, 12,000.....	5	5.00											
Geneva, 3,000.....	5	20.00		2	2								
Hamilton, 20,000.....	21	12.63	7	5	3							1	
Ironton, 12,000.....	18	18.00	4	3	1								
Kent, 4,100.....	5	14.63		1								1	
Lancaster, 8,000.....	9	13.50	2										
Leetonia, 4,000.....	14	9.00	2	1									
Mansfield, 15,000.....	14	11.20	4	2								1	
Marion, 8,000.....	5	7.50	1	2	1				1				
Mentor, 1,900.....	3	36.00		1								1	
Middletown, 8,200.....	7	10.24											
Nelsonville, 5,000.....	12	28.80	4	7	6								
Oberlin, 4,000.....	4	12.00											
Painesville, 5,000.....	10	42.00											
Piqua, 10,000.....	12	14.40	3	3		1						2	
Portsmouth, 14,000.....	13	11.14	7	3							1		
Reading, 3,000.....	5	20.00		3		1		1		1		1	
Sabina, 1,500.....	4	32.00	1	1	1								
Salem, 6,000.....	5	10.00	1	2								2	
Sandusky, 23,000.....	10	5.22	6	3				1	1				
St. Paris, 1,800.....	4	26.66	2	2					1				
Shawnee, 3,000.....	4	16.00		3			1				1		
Sidney, 5,100.....	3	7.59		2									
Springfield, 38,000.....	40	12.63	12	12	2			1	2			5	
Tiffin, 14,000.....	15	12.86		7	7								
Toledo, 81,650.....	105	15.43	45	40	13	3				3			
Urbana, 8,000.....	9	13.50	2										
Wadsworth, 2,500.....	3	14.40	1	1					1				
Washington C. H., 7,500.....	6	9.60	4	1									
Waverly, 1,600.....	3	22.50	1	1		1							
Wellsville, 6,000.....	11	22.00		4	1							3	
Wooster, 8,500.....	7	9.88		3								2	
Xenia, 9,000.....	8	10.66	1										
Youngstown, 25,000.....	36	17.28	11	12	3	2	1					4	
Zanesville, 25,000.....	17	8.28	2	5								5	
Totals: population.....1,308,500	1,674	15.35	493	357	180	43	3	20	13	4	8	106	2

*Premature and still-births excluded.

Clyde reports 1 death from typhoid fever; Conneaut 1 from violence; Crestline 1 from violence; Garrettsville 1 from violence; Lockland 1 from diphtheria; Uhrichsville 5 from typhoid fever and 2

CITIES AND TOWNS OF OHIO, DURING THE MONTH OF OCTOBER, 1890.

Total constitutional dis.	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmen'tal dis.	Total violence.	Premature and still-b'n.	Authority.
7	.....	6	11	1	1	1	3	2	1	3	.....	1	7	3	1	Dr. A. A. Kohler, H. O.
.....	.....	7	2	.....	.....	.....	.....	2	.....	2	.....	1	1	2	2	Dr. James Bates, H. O.
3	.....	3	.....	2	.....	.....	1	.....	.....	.....	.....	2	1	4	.....	Dr. A. W. Hopkins, H. O.
2	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Dr. J. Park West, H. O.
4	2	1	10	.....	2	.....	1	1	.....	1	.....	1	3	1	.....	John Earls, H. O.
1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Dr. J. F. Marchand, H. O.
.....	.....	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	Harry Ross, H. O.
3	.....	3	9	.....	.....	.....	.....	1	2	1	.....	1	.....	.....	.....	Dr. D. H. Richardson, H. O.
86	16	56	225	10	6	11	10	10	31	14	.....	34	39	23	39	Dr. J. F. Miller, H. O.
66	15	41	158	1	8	9	32	9	24	15	.....	30	15	17	54	Dr. J. W. Prendergast, H. O.
14	2	11	42	.....	2	5	6	5	11	1	.....	6	7	8	3	Dr. G. C. Ashmun, H. O.
.....	.....	.....	4	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	Dr. Lee McBriar, H. O.
13	3	10	33	2	.....	.....	1	.....	5	.....	.....	4	9	2	6	Dr. J. D. Dodge.
1	.....	1	4	.....	.....	.....	2	1	.....	.....	.....	.....	1	1	.....	Dr. J. M. Weaver, H. O.
.....	.....	3	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Dr. A. Berchtold, H. O.
1	1	.....	1	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	2	Dr. J. W. N. Vogt, H. O.
.....	.....	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	2	2	.....	.....	C. P. Washburn, H. O.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	2	2	Dr. C. C. McLaughlin, H. O.
.....	.....	.....	1	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	1	.....	Wm. Gibbs, H. O.
.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	Dr. A. L. Leicester, H. O.
.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Dr. W. N. Mundy, H. O.
.....	.....	.....	2	.....	.....	.....	.....	1	.....	.....	.....	1	.....	.....	.....	J. O. Hess, H. O.
1	.....	1	2	.....	.....	.....	.....	1	1	.....	.....	2	1	.....	.....	Dr. F. S. Hillbush, H. O.
4	.....	4	.....	.....	.....	.....	2	1	2	1	.....	.....	.....	.....	.....	Dr. C. W. Foster, H. O.
7	.....	6	5	2	.....	.....	1	.....	3	1	.....	.....	1	1	1	Dr. George Trebel, H. O.
2	1	1	1	.....	.....	.....	.....	.....	.....	.....	.....	1	1	.....	.....	Dr. N. K. Moxley, Jr., H. O.
4	.....	4	2	.....	.....	.....	.....	.....	2	.....	.....	.....	1	.....	.....	Dr. J. P. Holcomb, H. O.
1	.....	1	1	.....	.....	.....	.....	.....	1	.....	.....	.....	1	.....	1	Dr. J. W. Lewis, H. O.
3	1	2	9	.....	.....	.....	.....	1	.....	.....	.....	2	.....	.....	.....	Dr. S. R. McCready, H. O.
2	.....	2	1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Dr. R. Harvey Reed, H. O.
1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1	J. K. Redd, H. O.
2	1	1	3	.....	.....	.....	.....	.....	.....	2	.....	.....	1	.....	.....	Dr. M. T. Love, H. O.
.....	.....	3	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	2	.....	.....	Dr. G. D. Lummis, H. O.
1	.....	1	2	.....	1	.....	.....	.....	.....	.....	.....	2	2	.....	.....	Dr. Charles W. Cable, H. O.
1	.....	1	5	.....	1	.....	.....	2	.....	.....	.....	1	3	1	.....	Thomas R. Mayhew, H. O.
.....	.....	.....	6	.....	.....	.....	1	.....	.....	.....	.....	1	.....	2	1	H. P. Sanford, Clerk.
1	.....	1	7	.....	.....	5	.....	.....	2	.....	.....	.....	2	.....	.....	Dr. R. M. O'Ferrall, H. O.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	1	Dr. C. C. Fulton, H. O.
1	.....	1	2	.....	.....	.....	1	.....	1	.....	.....	.....	.....	.....	1	F. X. Ankenbauer, H. O.
.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	.....	Dr. A. J. Gaskins, H. O.
2	.....	2	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	2	.....	.....	Dr. T. T. Church, H. O.
.....	.....	.....	1	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	Dr. Elwood Stanley, H. O.
6	.....	6	13	.....	2	2	.....	.....	4	1	.....	.....	7	2	2	Dr. C. A. Offenbacher, H. O.
.....	.....	.....	8	2	1	.....	1	.....	2	.....	.....	2	.....	.....	.....	C. E. Whittington, Clerk.
10	2	6	37	2	1	2	8	2	7	3	.....	1	10	8	16	Dr. Edwin LeFevre, H. O.
2	2	2	3	.....	1	.....	.....	.....	1	1	.....	.....	1	1	.....	Dr. H. H. Seys, H. O.
1	1	.....	1	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	Dr. J. Bridinger, H. O.
2	.....	2	2	.....	.....	.....	.....	.....	1	.....	.....	1	1	.....	3	Dr. G. A. Collamore, H. O.
1	.....	1	1	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	Dr. H. C. Houston, H. O.
.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	T. W. Scrane, H. O.
2	1	1	1	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	J. M. Edwards, H. O.
.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	3	3	1	Dr. Austin Hutt.
2	1	3	5	.....	.....	.....	.....	.....	3	.....	.....	1	1	.....	.....	J. F. Davidson, H. O.
3	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Dr. J. M. Barrett, H. O.
4	.....	4	13	1	.....	1	3	2	.....	.....	.....	4	3	4	2	Dr. A. D. DeHaven, H. O.
2	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	4	2	1	Dr. W. L. Buechner, H. O.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	Dr. H. T. Sutton, H. O.
272	50	191	682	26	27	37	72	42	117	53	.....	102	147	98	147	

from heart disease; North Amherst 1 from heart disease and 1 old age; Ravenna 1 from phthisis pulmonalis; Richwood 1 from phthisis pulmonalis and 1 from heart disease.

Higginsport, Logan, Versailles and West Liberty report no deaths for October.

SUMMARY OF MORTALITY REPORTS

The total number of deaths reported from all causes—excluding premature and still-births—by the towns represented in the foregoing tables was 21,648. The average estimated population of the cities and towns represented was 1,212,727, which is equal to an annual death rate of 17.855 per thousand living population represented.

The deaths in 1,197,840 living population in 1889 (November, 1888, to November, 1889), was 16,762, equal to an annual death rate of 14.16 per thousand; while in 1888 (November, 1887, to November, 1888), the total number of deaths reported in 1,021,400 population was 16,851, equal to a mortality rate of 16.50 per thousand. The increased death rate of last year is believed to be principally due to more accurate reports, resulting from the enforcement of the rule requiring a burial permit for all interments, rather than to an actual increase in mortality.

The number of deaths reported each month was as follows:

January.....	2,184	July	2,135
February.....	1,685	August.....	1,958
March	1,927	September	1,614
April.....	1,687	October.....	1,674
May	1,781	November (1889).....	1,565
June.....	1,938	December (1889).....	1,500

The greatest number of deaths (2,184) were reported in January, the least number (1,500) in December.

DEATHS OF CHILDREN UNDER FIVE YEARS OF AGE.

The number of deaths reported of children under five years of age (premature and still-born excluded), was 7,562, which is equal to 35 per cent. of the deaths from all causes, and a death rate of 6.27 per thousand population represented.

The deaths by months, of children under five, was as follows:

January.....	727	July.....	913
February.....	647	August.....	760
March.....	630	September.....	506
April.....	554	October	498
May.....	612	November (1889)	452
June.....	793	December (1889).....	470

The greatest number of deaths reported in children under five (913) was in July; the least number (452) was in November.

ZYMOTIC DISEASES.

The total number of deaths reported from zymotic diseases was 5,390, which is equal to nearly 25 per cent. of the deaths reported from all causes, and an annual rate of 4.40 per thousand of the population represented.

The number of deaths reported the preceding year from zymotic diseases was 4,069, equal to a death rate of 3.39 per thousand population represented.

The number of deaths reported from zymotic diseases each month was as follows:

January	430	July.....	735
February.....	338	August.....	696
March.....	367	September.....	493
April.....	296	October.....	357
May.....	344	November (1889).....	435
June.....	519	December (1889).....	380

The month having the greatest number reported (725) was July; the one having the least (296) was April.

CROUP AND DIPHTHERIA.

The total number of deaths reported from croup and diphtheria was 1,714, which is equal to 7.8 per cent. of the deaths reported from all causes, and a death rate of 1.41 per thousand of the population represented.

The number of deaths reported the preceding year from these causes was 1,177, equal to a mortality rate of .98 per thousand of the population represented.

The number of deaths reported each month from croup and diphtheria was as follows:

January	151	July	62
February.....	145	August.....	77
March.....	115	September.....	115
April.....	96	October.....	180
May	97	November (1889).....	226
June.....	70	December (1889).....	380

The month having the greatest number reported (380) was December; the one having the least number (62) was July.

CHOLERA INFANTUM AND DIARRHŒA.

The total number of deaths reported from cholera infantum and diarrhœa was 1,275, which is equal to nearly 6 per cent. of the deaths

reported from all causes, and a mortality rate of 1.05 per thousand population represented.

The total number of deaths reported from these diseases during the preceding year was 940, equal to a mortality rate of .79 per thousand population represented.

The deaths as reported by months was as follows :

January.....	12	July.....	380
February.....	5	August.....	327
March.....	15	September.....	146
April.....	20	October.....	63
May.....	33	November (1889).....	26
June.....	232	December (1889).....	16

The month having the greatest number reported (380) was July; the one having the least (5) was February.

MEASLES, SCARLET FEVER AND WHOOPING COUGH.

The total number of deaths reported from measles, scarlet fever and whooping cough was 569, which is equal to 2.6 per cent. of the total number of deaths reported from all causes, and a mortality rate of .46 per thousand of the population represented.

The total number of deaths reported from these diseases during the preceding year was 381, equal to a mortality rate of .31 per thousand population represented.

The deaths, as reported by months, were as follows :

January.....	84	July.....	16
February.....	72	August.....	32
March.....	75	September.....	16
April.....	58	October.....	14
May.....	70	November (1889).....	40
June.....	34	December (1889).....	58

The month in which the greatest number of deaths were reported (84) was January; the least number (14) was reported in October.

TYPHOID FEVER.

The total number of deaths reported from typhoid fever was 748, which is equal to 3.4 per cent. of the total number reported from all causes, and a mortality rate of .62 per thousand population represented.

The number of deaths reported from this cause the preceding year was 540, equal to a mortality rate of .45 per thousand living population represented.

The number of deaths from typhoid fever as reported by months was as follows :

January	62	July.....	61
February	34	August	107
March.....	40	September.....	117
April.....	33	October	106
May.....	36	November (1889)	53
June.....	44	December (1889).....	55

The greatest number of deaths (117) were reported in September
least number (33) in April.

CONSTITUTIONAL DISEASES.

The total number of deaths reported from constitutional diseases was 3,576, which is equal to 16 per cent. of the deaths reported from all causes, and a mortality rate of 2.94 per thousand population represented.

The number of deaths reported from constitutional diseases the preceding year was 3,257, equal to a mortality rate of 2.72 per thousand population represented.

The number of deaths as reported by months was as follows:

January	380	July	286
February	295	August	315
March.....	335	September	257
April	305	October	272
May.....	310	November (1889)	275
June.....	287	December (1889).....	259

The greatest number of deaths (380) were reported in January
the least number (257) were reported in September.

CANCER.

The total number of deaths reported from cancer was 498, which is equal to 2.2 per cent. of the deaths reported from all causes, and a mortality rate of .41 per thousand population represented.

The deaths as reported by months were as follows:

January	35	July.....	57
February	31	August	52
March.....	39	September.....	43
April.....	41	October	50
May.....	35	November (1889).....	40
June.....	42	December (1889).....	33

The month having the greatest number reported was July (57), the
month having the least February (31).

CONSUMPTION.

The total number of deaths reported from consumption was 2,457, which is equal to 11 per cent. of the deaths reported from all causes, and a mortality rate of 2.02 per thousand population represented.

The number of deaths reported from this cause the preceding year was 2,098, equal to a mortality rate of 1.75 per thousand population represented.

The number of deaths as reported each month was as follows :

January	290	July	177
February	216	August	179
March	246	September	171
April	218	October	191
May	216	November (1889)	172
June	192	December (1889)	189

The greatest number of deaths were reported in January (290); the least number (171) in September.

LOCAL DISEASES.

The total number of deaths reported from local diseases was 9,340, which is equal to 43 per cent. of the deaths reported from all causes, and a mortality rate of 7.70 per thousand population represented.

The number of deaths reported from local diseases the preceding year was 6,686, equal to a mortality rate of 5.58 per thousand population represented.

The deaths reported by months were as follows :

January	1,088	July	738
February	834	August	523
March	974	September	609
April	896	October	682
May	896	November (1889)	646
June	804	December (1889)	650

The month having the greatest number of deaths reported (1,088) was January; the one having the least number (523) was August.

BRONCHITIS, PLEURISY AND PNEUMONIA.

The total number of deaths reported from bronchitis, pleurisy and pneumonia was 2,764, which is equal to 13 per cent. of the deaths reported from all causes, and a mortality rate of 2.28 per thousand of the population represented.

In the preceding year there were 1,697 deaths reported from these causes, equal to a mortality rate of 1.41 per thousand population represented.

The deaths, as reported by months, were as follows:

January	488	July	102
February	335	August	101
March	348	September	94
April	334	October	139
May	275	November (1889)	170
June	150	December (1889)	228

The month in which the greatest number of deaths were reported was January (488); the least number (94) was reported in September.

CONVULSIONS AND MENINGITIS.

The total number of deaths reported from convulsions and meningitis was 1,883, which is equal to 8 per cent. of the deaths reported from all causes, and a mortality rate of 1.55 per thousand population represented.

The number of deaths reported from these diseases the preceding year was 1,213, equal to a mortality rate of 1.01 per thousand population represented.

The deaths, as reported by months, were as follows:

January	162	July	192
February	135	August	148
March	161	September	118
April	154	October	125
May	194	November (1889)	123
June	243	December (1889)	128

The greatest number of deaths were reported in June (243); the least number (118) in September.

DEVELOPMENTAL DISEASES.

The total number of deaths from developmental diseases reported (excluding premature and still-births) was 2,019, which is equal to 8 per cent. of the deaths reported from all causes, and a mortality rate of 1.66 per thousand population represented. During the preceding year there was 1,452 deaths reported from developmental diseases, equal to a mortality rate of 1.21 per thousand population represented.

The deaths, as reported by months, were as follows :

January	189	July	198
February.....	148	August	182
March.....	252	September	138
April.....	249	October.....	147
May.....	168	November (1889).....	101
June	111	December (1889).....	136

The greatest number of deaths (252) were reported in March; the least number (101) in November.

PREMATURE AND STILL-BIRTHS.

The total number of premature and still-births reported was 1,804, which is equal to 8 per cent. of the deaths reported from all causes, and a rate of 1.49 per thousand population represented.

During the preceding year there were 1,514 premature and still-births reported, equal to a rate of 1.25 per thousand population represented.

The premature and still-births, as reported by months, were as follows :

January	149	July	132
February.....	196	August.....	123
March.....	190	September	83
April.....	148	October	147
May.....	173	November (1889).....	162
June.....	148	December (1889).....	153

The greatest number (196) was reported in February; the least number (83, with Cincinnati not reporting) was in September.

VIOLENCE.

The total number of deaths reported from violence was 1,011, which is equal to 5 per cent. of the deaths reported from all causes, and a mortality rate of .83 per thousand population represented.

During the preceding year there were 866 deaths reported from violence, equal to a mortality rate of .72 per thousand population represented.

The deaths, as reported by months, were as follows :

January	61	July	122
February.....	48	August	101
March	77	September	123
April.....	47	October	98
May.....	79	November (1889)	68
June.....	118	December (1889).....	69

The greatest number of deaths were reported in September (123); the least number (48) in February.

Reports of Meteorological Observations

FOR THE

YEAR ENDING OCTOBER 31, 1890.

FURNISHED THE STATE BOARD OF HEALTH BY THE OHIO METEOROLOGICAL BUREAU.

METEOROLOGICAL OBSERVATIONS FOR THE MONTH OF NOVEMBER, 1889, FURNISHED

Stations.	Ozone. Monthly mean.		Mean barometer.	Highest barometer.	Date.	Lowest barometer.	Date.	Range of barometer.	Mean relative humidity.	Mean temperature.	Highest temperature.
	7 A. M. to 2 P. M.	9 P. M. to 7 A. M.									
Cincinnati			30.118	30.591	16th.	29.539	21st.	1.052	79.2	43.1	72.0
Dayton	1.38	0.88	30.106	30.637	16th.	29.478	21st.	1.159	83.9	41.5	67.0
Wapakoneta			30.107	30.658	16th.	29.522	21st.	1.136	89.9	39.9	62.0
Sidney			30.101	30.621	16th.	29.641	21st.	.980	86.6	39.8	61.7
Greenville	2.81	3.67	30.093	30.631	16th.	29.490	21st.	1.141	89.4	39.3	61.5
Celina	3.01	3.00	30.091	30.680	16th.	29.491	21st.	1.189	82.2	41.3	63.5
Upper Sandusky	4.20	4.10	30.086	30.687	16th.	29.520	21st.	1.167	86.5	40.8	64.0
Postoria			30.067	30.673	16th.	29.459	21st.	1.214	81.2	41.2	63.0
Findlay			30.087	30.672	16th.	29.484	21st.	1.188	83.7	39.3	63.0
Wauseon	2.79	2.76	30.071	30.678	16th.	29.465	21st.	1.213	81.8	38.1	62.3
Clarksville	5.20	5.60	30.129	30.627	16th.	29.495	21st.	1.132	83.4	40.0	71.2
Yellow Springs			30.096	30.628	16th.	29.490	21st.	1.138		40.4	64.5
North Lewisburg	0.75	0.65	30.122	30.570	16th.	29.581	21st.	.989	81.8	40.6	64.0
Bangorville			28.628	29.122	16th.	28.055	22d.	1.067	82.0	38.5	68.5
Toledo			30.076	30.652	16th.	29.461	22d.	1.191	82.1	40.4	63.0
Sandusky	0.24	0.83	30.070	30.641	16th.	29.428	22d.	1.203	78.8	41.0	68.9
Hanging Rock	0.17	0.10	30.105	30.607	30th.	29.473	21st.	1.134	88.3	42.2	77.0
Portsmouth	0.00	0.00	30.138	30.670	30th.	29.504	21st.	1.166	84.4	43.7	75.5
Waverly			30.070	30.585	16th.	29.413	21st.	1.172	82.2	44.5	74.5
Georgetown			30.109	30.602	30th.	29.455	21st.	1.147	88.4	41.3	73.5
Columbus			30.112	30.646	16th.	29.506	21st.	1.140	79.1	41.2	67.0
O. S. University			30.085	30.640	16th.	29.465	21st.	1.175	85.7	40.7	66.0
Westerville	1.97	1.90	30.068	30.620	16th.	29.460	21st.	1.168	88.0	40.7	67.0
Logan			30.098	30.669	16th.	29.474	21st.	1.195	87.8	41.2	73.0
Oberlin			30.101	30.657	16th.	29.427	21st.	1.280	86.8	39.9	65.0
Marietta			30.112	30.663	16th.	29.473	21st.	1.190	82.7	43.3	73.0
McConnellsville			30.090	30.673	30th.	29.477	21st.	1.196	84.7	42.7	72.1
Pomeroy			30.118	30.606	16th.	29.534	21st.	1.072	87.0	45.4	71.0
Athens			30.079	30.620	16th.	29.443	21st.	1.177	81.2	41.8	72.0
Granville			30.088	30.648	16th.	20.494	21st.	1.154	83.1	39.8	66.0
Newcomerstown			30.086	30.661	16th.	20.494	21st.	1.191	89.6	40.1	66.0
New Alexandria									84.6	41.4	67.0
Canton			30.073	30.676	16th.	29.460	22d.	1.211		40.8	69.3
Youngstown	0.91	1.00	30.041	30.595	16th.	29.417	22d.	1.178	87.9	42.7	64.0
Hiram			30.078	30.639	16th.	29.471	22d.	1.168	88.0	33.5	64.0
Jefferson			30.025	30.614	16th.	29.395	22d.	1.219	87.0	39.5	65.0
Wooster	3.06	3.14	30.095	30.684	16th.	29.506	22d.	1.178	83.7	39.3	65.0
Cleveland (S. O.)			30.080	30.650	16th.	29.450	21st.	1.120	78.0	41.7	66.0
Cleveland (Hyde)					16th.					43.5	66.4
Akron	0.00	0.00	30.068	30.658	16th.	29.463	22d.	1.195	90.1	40.6	65.2
Hudson											
Weymouth											
Ellsworth											
Ashland											
Ottawa											
Lordstown											
Tiffin											
Kenton											
Waynesville											
Springboro											
Jacksonburg											
Circleville											
State			30.107	30.687	16th.	29.395	22d.	1.292	85.6	41.0	77.0

The mean atmospheric pressure, 30.107 inches, was normal. The highest barometer, 30.689 inches, occurred at Upper Sandusky on the 16th, and the lowest, 29.395 inches, at Jefferson on the 22d. The mean temperature of the northern section was 40° 5; of the middle section 40° 3; and of the State 41° 0. These means are 0° 8, 0° 3 and 0° 3 above the averages for the past eight years. The mean for the section, 42° 4, was 0° 1 below the eight-year average. The maximum temperature reported was 77° 0 at Hanging Rock on the 1st, and the minimum, 8° 6, at Wauseon on the 30th. The mean daily range of temperature was 15° 1. The greatest daily range was 38° 5, at Portsmouth on the 12th, and the smallest, 2° 0, at Cincinnati on the 22d. The mean relative humidity, 85.6 per cent., was 6.5 per cent. above the average for November. Precipitation was general in all sections on the 2d, 8th, 9th, 13th, 17th, 18th, 19th, 20th, 21st, 22d, 26th, 27th, 28th and 29th; and in the middle and southern sections on the 24th and 25th. Local rains occurred in all sections on the 10th; in the northern section

THE STATE BOARD OF HEALTH BY THE OHIO METEOROLOGICAL BUREAU.

Date.	Lowest temperature.	Date.	Range of temperature.	Mean daily range of temperature.	Greatest daily range of temperature.	Date.	Least daily range of temperature.	Date.	Number of clear days.	Number of fair days.	Number of cloudy days.	Days on which rain fell, with 0.1 rain fall.	Total rainfall for month.	Average daily rainfall.	Direction of wind.
2d.	20.0	30th.	52.0	12.6	30.0	12th.	2.0	22d.	6	3	21	18	5.28	.176	W.
1st.	19.0	30th.	48.0	14.0	28.5	12th.	5.7	20th.	6	7	17	14	4.05	.135	S. W.
2d.	15.0	30th.	47.0	15.5	29.0	12th.	7.0	.....	9	3	18	10	4.65	.155	S. W.
3d.	16.0	30th.	45.7	15.3	30.4	3d.	5.1	10th.	9	6	15	13	6.56	.219	S. W.
2d.	18.0	30th.	43.5	11.7	24.8	12th.	3.2	20th.	6	7	17	17	4.03	.134	W.
.....	20.2	30th.	43.3	14.6	28.5	6th.	4.0	20th.	6	4	20	9	3.67	.115	S. W.
2d.	15.0	30th.	49.0	15.7	29.0	12th.	6.0	20th.	3	7	20	16	2.76	.092	W.
.....	10.0	30th.	53.0	19.2	32.0	2d.	3.0	.....	2	4	24	5	2.40	.080	W.
.....	12.0	30th.	51.0	16.0	32.2	12th.	4.7	20th.	3	8	19	11	2.93	.098	S. W.
2d.	8.6	30th.	53.7	14.3	27.7	16th.	4.9	20th.	4	6	20	17	3.67	.122	W.
1st.	17.0	30th.	54.2	15.1	30.8	12th.	4.9	20th.	8	5	17	16	4.96	.165	W.
1st.	17.0	30th.	47.5	15.7	29.0	7th.	6.7	20th.	8	3	19	16	4.55	.142	S. W.
12th.	16.0	30th.	48.0	15.2	34.0	12th.	5.0	.....	5	8	17	12	4.20	.140	W.
2d.	16.0	30th.	47.5	15.5	26.7	7th.	6.0	20th.	5	5	20	14	3.59	.120	S. W.
2d.	14.0	30th.	49.0	11.8	24.0	12th.	6.0	.....	7	6	17	15	2.28	.077	W.
2d.	16.0	30th.	52.0	11.3	27.0	12th.	4.0	.....	3	5	22	16	1.71	.056	S. W.
1st.	18.0	30th.	59.0	18.6	37.0	24th.	4.0	22d.	4	11	15	18	3.79	.126	S. W.
1st.	18.5	30th.	57.0	17.9	38.5	12th.	4.5	29th.	5	9	16	15	3.98	.133	S. W.
1st.	21.0	30th.	53.5	17.1	35.5	1st.	6.0	29th.	7	6	17	16	4.40	.147	W.
1st.	11.0	30th.	62.5	16.6	30.0	4th.	6.5	13th.	5	5	20	16	5.91	.197	N. W.
1st.	21.0	30th.	46.0	12.0	28.0	12th.	3.0	29th.	5	7	18	17	3.83	.128	W.
1st.	21.0	30th.	45.0	15.4	33.0	12th.	5.0	.....	5	8	17	18	3.71	.124	W.
1st.	19.0	30th.	48.0	11.4	26.0	16th.	3.5	8th.	4	6	20	12	3.69	.123	S. W.
1st.	20.0	30th.	53.0	18.8	35.0	4th.	6.5	29th.	6	6	18	14	5.11	.170	N. W.
2d.	11.0	29th.	54.0	12.8	29.0	25th.	5.0	21st.	9	4	17	8	2.42	.081	W.
2d.	21.5	30th.	51.5	16.9	33.5	12th.	6.9	29th.	4	10	16	19	5.46	.182	S. W.
1st.	18.1	6th.	54.0	17.9	36.8	12th.	6.0	29th.	4	8	18	17	4.37	.146	W.
1st.	23.0	30th.	48.0	16.6	33.0	12th.	5.0	29th.	8	5	17	12	3.79	.126	W.
1st.	18.5	30th.	53.5	17.3	36.5	12th.	5.2	15th.	3	7	20	14	4.55	.152	S. W.
1st.	18.0	29th.	48.0	11.1	28.0	12th.	5.0	21st.	3	7	20	13	4.50	.150	W.
1st.	19.0	29th.	47.0	14.8	29.5	12th.	6.0	21st.	3	11	16	14	4.44	.148	W.
1st.	18.0	.....	49.0	14.7	27.0	1st.	4.0	23d.	5	8	17	16	4.63	.154	S. W.
2d.	17.5	29th.	52.3	14.6	29.1	12th.	6.4	23d.	3	7	20	16	3.82	.127	S. W.
1st.	17.0	29th.	47.0	13.0	29.5	8th.	8.0	.....	1	6	23	10	2.71	.090	S.
2d.	14.0	29th.	50.5	14.7	28.2	21th.	3.8	23d.	3	9	18	13	2.25	.075	S. W.
2d.	17.0	30th.	48.0	12.9	28.0	12th.	5.0	.....	0	10	20	16	4.29	.143	S.
2d.	16.0	29th.	49.0	13.6	31.0	12th.	5.5	21st.	3	8	19	14	3.53	.118	W.
2d.	18.0	29th.	48.0	11.0	26.0	12th.	3.0	25th.	3	6	21	18	3.72	.124	S. W.
2d.	18.0	29th.	48.4	12.0	25.5	12th.	4.3	19th.	1	7	22	17	2.96	.099	W.
2d.	16.4	29th.	48.8	13.5	24.4	12th.	6.1	23d.	3	5	22	16	3.09	.103	S. W.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.63	.088	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.59	.086	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3.75	.125	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.53	.084	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.21	.074	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.48	.083	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3.60	.120	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5.05	.168	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3.73	.124	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.12	.173	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5.01	.167	.....
1st.	8.6	30th.	68.4	15.0	38.5	12th.	2.0	22d.	4.9	6.5	18.6	14.1	4.02	.134	W.

on the 1st and 23d, and in the northern and middle sections on the 14th and 15th. The mean rainfall in the northern section, 2.83 inches, was .01 below the eight-year average. The mean in the middle section was 4.31 inches, and in the southern section 4.90 inches. These means are 1.02 inches and 1.63 inches above the averages for November. The mean for the State, 4.01 inches, is .88 inch above the average. The greatest monthly rainfall was 8 inches, at West Milton, and the smallest, 1.71 inches, at Sandusky and Vienna. A thunder storm was reported from Georgetown on the 25th. The percentage of verifications of weather signals received from Washington and distributed to thirty display stations (computed from reports of observers), was 86 for weather and 87 for temperature. The first decided cold wave of the season occurred on the 29th. The prevailing direction of wind was west.

METEOROLOGICAL OBSERVATIONS FOR THE MONTH OF DECEMBER, 1889, FURNISHED

Stations.	Ozone. Monthly mean.		Mean barometer.	Highest barometer.	Date.	Lowest barometer.	Date.	Range of barometer.	Mean relative humidity.	Mean temperature.	Highest temperature.
	7 A. M. to 2 P. M.	9 P. M. to 7 A. M.									
Cincinnati.....			30.172	30.604	1st.	29.779	29th.	.825	76.9	48.0	69.0
Dayton.....	4.33	5.17	30.147	30.611	30th.	29.544	29th.	1.067	79.1	46.2	68.0
Wapakoneta.....			30.133	30.538	1st.	29.665	29th.	.873	86.6	42.9	65.0
Sidney.....									81.8	43.5	65.5
Greenville.....	3.16	4.13	30.129	30.600	30th.	29.669	29th.	.931	87.4	43.4	64.0
Celina.....	1.03	1.03	30.120	30.629	30th.	29.637	29th.	.992	80.0	45.2	69.5
Upper Sandusky...	3.55	3.61	30.136	30.569	31st.	29.625	29th.	.944	84.9	42.7	65.0
Fostoria.....			30.108	30.631	31st.	29.540	29th.	1.091	80.4	42.4	67.0
Findlay.....			30.114	30.651	30th.	29.595	29th.	1.056	79.0	42.0	67.0
Wauseon.....	2.70	2.20	30.166	30.642	31st.	29.524	29th.	1.118	73.3	38.7	64.5
Clarksville.....	3.80	4.50	30.145	30.625	30th.	29.752	29th.	.873	78.8	45.1	67.9
Yellow Springs.....			30.141	30.601		29.693	29th.	.908		44.2	65.8
North Lewisburg...	1.45	0.30	30.180	30.555	30th.	29.720	29th.	.835	82.2	44.2	67.0
Bangorville.....			28.685	29.098	31st.	28.227	29th.	.871	77.5	40.8	64.0
Toledo.....			30.113	30.617	31st.	29.591	29th.	1.026	77.3	41.5	70.0
Sandusky.....			30.113	30.626	31st.	29.705	29th.	.921	75.6	41.6	70.0
Hanging Rock.....	0.00	0.06	30.183	30.651	1st.	29.829	8th.	.822	89.5	46.7	73.0
Portsmouth.....	0.00	0.00	30.206	30.686	1st.	29.860	29th.	.886	82.7	48.7	70.5
Waverly.....			30.130	30.631	1st.	29.709	29th.	.922	79.6	48.6	71.0
Georgetown.....			30.161	30.643	1st.	29.752	29th.	.891	84.8	47.1	67.5
Columbus.....			30.163	30.610	1st.	29.754	29th.	.856	74.2	44.6	67.0
O. S. University.....			30.135	30.643	30th.	29.651	29th.	.952	80.4	43.6	67.0
Logan.....			30.167	30.630	1st.	29.764	29th.	.869	84.5	44.5	69.0
Oberlin.....			30.140	30.667	30th.	29.469	29th.	1.198	85.4	42.5	65.0
Marietta.....			30.153	30.663	1st.	29.753	29th.	.910	77.9	45.7	70.5
McConnellsville.....			30.154	30.616	1st.	29.775	29th.	.841	75.6	45.0	68.3
Pomeroy.....			30.181	30.650	1st.	29.846	8th.	1.004	84.2	48.7	66.0
Athens.....			30.148	30.629	1st.	29.700	29th.	.929	80.3	45.7	67.0
Newcomerstown.....			30.185	30.626	1st.	29.647	29th.	.979	87.8	41.3	65.5
New Alexandria.....									77.2	43.8	64.0
Canton.....			30.131	30.654	31st.	29.618	29th.	1.036		41.1	65.5
Youngtowns.....	1.13	1.13	30.125	30.603	31st.	29.622	29th.	1.081	86.0	42.0	65.0
Hiram.....			30.117	30.674	31st.	29.595	29th.	1.079	80.5	39.7	66.0
Jefferson.....			30.071	30.651	31st.	29.508	29th.	1.143	83.3	38.4	64.0
Wooster.....	2.23	2.03	30.146	30.678	31st.	29.608	29th.	1.070	79.1	40.7	64.5
Cleveland (S. O.)...			30.128	30.668	31st.	29.668		1.000	73.4	42.0	66.0
Cleveland (Hyde)...										12.2	66.1
Akron.....	0.00	0.03	30.121	30.648	31st.	29.581	29th.	1.067	89.3	41.1	64.7
Hudson.....											
Weymouth.....											
Ellsworth.....											
Ashland.....											
Ottawa.....											
Lordstown.....											
Tiffin.....											
Kenton.....											
Waynesville.....											
Springboro.....											
Jacksonburg.....											
Circleville.....											
State.....			30.139	30.686	1st.	29.469	29th.	1.217	80.9	43.8	73.0

The mean atmospheric pressure, 30.139 inches, was .002 inch below the average for the past eight years. The highest barometer, 30.686 inches, occurred at Portsmouth on the 1st, and the lowest, 29.469 inches, at Oberlin on the 29th. This was the warmest December on record in the Bureau. The mean temperature, 43.8, was 11° 5 above the average, and 10° 5 above the highest previous record, 33° 3 in December, 1888. The mean in the northern section was 41° 2, the middle section 43° 4, and in the southern section 46° 8. These means are 10° 4, 11° 9, and 12° 3 above the eight-year averages for the sections. The highest temperature reported during the month was 73° at Hanging Rock, on the 10th. This is the highest maximum since 1886. The minimum temperature, 10°, occurred at Wapakoneta on the 1st, and is the highest minimum on record for December. The average daily range of temperature was 19° 1. The greatest daily range was 38° 9, at McConnellsville on the 2d, and the smallest, 2°, at Columbus on the 18th. The mean relative humidity, 80.9 per cent., was slightly below the normal. Precipitation was general in all sections on the 5th, 8th, 10th, 11th, 17th, 18th, 20th, 22d, 26th and 29th; in the northern and middle sections on the 14th and 16th; in the northern section on the 3d and 21st; and in the southern section on the 7th. Local rains occurred in all sections on the 21st and

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Date.	Lowest temperature.	Date.	Range of temperature.	Mean daily range of temperature.	Greatest daily range of temperature.	Date.	Least daily range of temperature.	Date.	Number of clear days.	Number of fair days.	Number of cloudy days.	Days on which rain fell, with 0.1 rainfall.	Total rainfall for month.	Average daily rainfall.	Direction of wind.
29th	21.0	1st.	48.0	16.9	31.0	24th.	8.0	30th.	6	9	16	11	2.02	.065	S.W.
29th.	19.5	1st.	48.5	18.9	32.0	29th.	7.5	17th.	8	8	15	7	2.09	.087	S.W.
29th.	10.0	1st.	55.0	21.8	32.0	29th.	8.1	4th.	14	5	12	3	1.45	.017	S.W.
29th.	19.2	1st.	46.3	17.9	27.5	23th.	8.1	17th.	12	8	11	8	3.01	.097	S.W.
29th.	19.5	31st.	44.5	16.0	30.0	29th.	4.5	4th.	11	8	12	13	2.77	.089	S.
29th.	23.0	31st.	46.5	18.1	33.0	29th.	9.5	4th.	6	13	12	6	2.90	.074	S.W.
29th.	20.0	1st.	45.0	17.5	27.0	.....	8.0	14th.	7	14	10	13	2.52	.081	S.W.
29th.	22.0	31st.	45.0	19.1	31.0	29th.	9.0	18th.	7	11	13	11	3.95	.127	W.
29th.	18.6	1st.	50.4	19.5	31.5	29th.	8.7	14th.	9	11	11	11	3.59	.116	S.W.
29th.	14.8	1st.	49.7	19.7	31.1	29th.	4.7	17th.	5	12	14	17	2.85	.092	S.W.
29th.	16.4	1st.	51.5	18.8	31.7	29th.	4.3	4th.	9	11	11	11	2.73	.088	S.W.
29th.	14.7	1st.	51.1	18.9	32.3	29th.	8.7	.....	10	8	13	11	2.83	.091	S.W.
29th.	13.0	1st.	54.4	18.7	30.0	.....	3.0	28th.	12	7	12	12	3.00	.097	S.W.
29th.	12.5	1st.	51.5	19.4	29.0	29th.	8.5	15th.	8	10	13	12	3.22	.104	S.W.
29th.	20.0	1st.	50.0	16.3	36.0	29th.	8.0	8th.	11	7	13	13	2.62	.085	S.W.
29th.	20.0	1st.	50.0	14.5	31.0	29th.	4.0	20th.	3	13	15	14	3.65	.118	S.W.
10th.	17.0	1st.	56.0	23.2	35.0	2d.	7.0	.....	5	14	12	12	1.58	.051	E.
10th.	19.5	1st.	51.0	21.5	37.5	24th.	6.0	4th.	9	8	14	12	2.25	.073	S.W.
29th.	16.5	1st.	54.5	21.1	36.0	1st.	9.0	.....	10	10	11	14	1.70	.055	S.W.
.....	15.0	1st.	52.5	21.3	31.5	29th.	4.5	25th.	6	9	16	11	1.68	.054	S.W.
29th.	20.0	1st.	47.0	15.4	30.0	24th.	2.0	18th.	8	11	12	10	2.36	.076	S.
29th.	17.0	1st.	50.0	20.6	33.0	24th.	9.0	.....	11	10	10	10	2.24	.072	S.
29th.	14.0	1st.	55.0	22.3	37.0	24th.	7.0	25th.	11	9	11	10	2.76	.089	S.E.
29th.	19.0	.....	46.0	19.3	29.0	9th.	11.0	15th.	11	10	10	11	3.55	.115	W.
17th.	15.8	.....	54.7	21.2	30.0	24th.	8.1	25th.	7	13	11	13	2.52	.081	S.W.
29th.	14.0	1st.	54.8	23.7	38.9	2d.	8.8	7th.	10	8	13	10	2.42	.078	S.
.....	15.0	1st.	51.0	21.8	34.5	24th.	10.0	25th.	7	13	11	9	1.54	.050	W.
.....	13.5	1st.	53.5	23.5	38.5	24th.	6.8	4th.	7	9	15	7	2.63	.085	S.W.
29th.	14.0	1st.	51.5	19.4	32.5	24th.	9.0	4th.	8	8	15	10	2.16	.070	W.
29th.	15.0	1st.	49.0	16.8	34.0	30th.	9.0	25th.	15	7	9	10	2.67	.086	S.W.
29th.	17.2	1st.	48.3	17.5	27.2	24th.	7.0	6th.	10	10	11	11	3.48	.112	S.
.....	15.2	4th.	49.8	22.3	35.0	25th.	10.0	22d.	10	9	12	11	3.13	.111	W.
29th.	16.0	.....	50.0	18.0	30.0	29th.	7.0	5th.	11	5	15	13	4.03	.130	S.W.
29th.	15.0	1st.	49.0	16.8	28.0	29th.	6.0	14th.	9	7	15	14	3.92	.126	S.
29th.	17.5	1st.	47.0	16.7	27.0	29th.	6.0	15th.	9	10	12	13	3.93	.127	S.
29th.	19.0	1st.	47.0	14.5	27.0	24th.	3.0	30th.	10	8	13	16	3.24	.105	S.W.
29th.	19.0	1st.	47.1	15.1	26.8	24th.	5.8	14th.	7	6	18	14	2.94	.095	S.
29th.	18.5	1st.	46.2	16.6	25.7	.....	6.8	15th.	5	10	16	15	3.37	.109	S.W.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.34	.140	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3.86	.125	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3.59	.116	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.64	.088	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3.09	.099	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3.60	.117	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.42	.078	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3.11	.100	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3.63	.117	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.05	.066	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.79	.058	.....
10th.	10.0	1st.	63.0	19.1	38.9	2d.	2.0	18th.	8.6	9.5	12.9	11.4	2.81	.091	S.W.

25th, and in the middle and southern sections on the 3d and 9th. The precipitation was almost entirely in the form of rain. The only snow reported was a trace at a few stations in the northern and middle sections on the 3d and 4th. Not a single station reported snow on the ground at close of month. Thunder storms were reported on the 8th, 10th, 14th, 20th, 21st, 22d, 25th and 26th, and a number of stations reported hail on the 10th. The mean rainfall in the northern section 3.43 inches, was .96 inch above the average. The mean for the State, 2.81 inches, was also above the average, being .23 inch in excess of the usual rainfall for December. The mean in the northern section was 2.60 inches, and in the southern section 2.40 inches. These means are .02 and .26 inch below the averages for those sections for December. The greatest monthly rainfall reported was 5.32 inches, at Poland, and the smallest 1.45 inches at Wapakoneta. The percentage of verifications of weather signals received from Washington, and distributed to thirty-two display stations, was eighty-eight for weather and eighty-two for temperature. Cold wave signals were ordered on the 13th, 20th, 25th and 29th. The signals of the 26th and 29th were justified. The prevailing direction of wind was southwest.

METEOROLOGICAL OBSERVATIONS FOR THE MONTH OF JANUARY, 1890, FURNISHED

Stations.	Ozone. Monthly mean.		Mean barometer.	Highest barometer.	Date.	Lowest barometer.	Date.	Range of barometer.	Mean relative hu- midity.	Mean temperature.	Highest temperature.
	7 A. M. to 2 P. M.	9 P. M. to 7 A. M.									
Cincinnati			30.238	30.479	22d.	29.734	12th.	1.015	78.0	41.5	71.0
Dayton	0.43	1.40	30.221	30.773	22d.	29.602	12th.	1.171	84.9	40.5	68.0
Wapakoneta			30.243	30.782	22d.	29.625	12th.	1.157	92.8	37.6	66.0
Sidney									86.3	38.0	64.3
Greenville	4.30	3.95	30.215	30.780	22d.	29.566	12th.	1.211	91.0	37.1	62.5
Celina	1.00	1.00	30.203	30.774	28th.	29.704	12th.	1.070	82.7	38.6	68.8
Upper Sandusky			30.223	38.800	22d.	29.674	12th.	1.156	91.1	38.2	66.0
Fostoria			30.196	30.784	22d.	29.715	26th.	1.069	85.5	36.8	68.0
Findlay			30.204	30.781	22d.	29.540	12th.	1.241	87.4	36.5	67.0
Wauseon	2.40	2.36	30.172	30.770	22d.	29.383	13th.	1.407	83.3	33.2	66.0
Clarksville	3.76	4.90	30.254	31.789	22d.	29.680	12th.	1.109	83.2	39.9	67.2
Yellow Springs			30.215	30.757	23th.	29.645	12th.	1.112		38.9	65.5
North Lewisburg			30.242	30.732	3d.	29.881	16th.	.852	86.1	37.9	68.0
Bangorville			28.641	29.228	23th.	28.332	12th.	.896	78.9	36.2	63.5
Toledo			30.175	30.744	28th.	29.594	12th.	1.110	81.4	36.1	71.0
Sandusky	0.03	0.13	30.178	30.749	28th.	29.603	13th.	1.146	78.8	35.9	69.0
Hanging Rock	0.00	0.97	30.248	30.768	28th.	29.795	12th.	.973	87.1	43.1	75.0
Portsmouth			30.257	30.788	22d.	29.785	12th.	1.003	83.1	44.8	72.0
Waverly			30.204	30.738	22d.	29.733	12th.	.998	81.3	44.0	70.0
Georgetown			30.239	30.740	28th.	29.732	12th.	1.068	87.3	41.6	67.0
Columbus			30.223	30.764	22d.	29.767	12th.	.997	78.6	39.1	67.0
O. S. University			30.204	30.762	22d.	29.663	12th.	1.099	86.8	38.8	63.3
Westerville	1.86	1.87	30.189	30.730	28th.	29.740	26th.	.990	89.0	37.2	64.5
Logan	0.00	0.00	30.260	30.778	22d.	29.776	12th.	1.072	85.7	41.0	69.0
Oberlin			30.199	30.786	28th.	29.581	12th.	1.205	85.5	36.6	66.0
Marietta			30.253	30.772	22d.	29.763	13th.	.989	81.9	42.6	69.0
McConnellsville			30.233	30.766	22d.	29.795	26th.	.971	85.1	41.4	69.9
Pomeroy			30.271	30.733	28th.				89.7	44.1	69.0
Athens			30.213	30.742	25th.	29.736	26th.	1.006	81.5	41.8	69.6
Newcomertown			30.208	30.752	22d.	29.724	13th.	1.028	88.6	38.4	65.5
New Alexandria									80.4	39.4	64.0
Canton			30.200	30.739	23th.	29.660	13th.	1.079		36.8	66.0
Youngstown	1.10	1.16	30.161	30.703	3d.	29.501	13th.	1.202	86.8	38.6	65.0
Hiram			30.182	30.744	22d.	29.659	13th.	1.085	88.3	34.6	65.4
Jefferson			30.141	30.689	3d.	29.432	13th.	1.257	88.7	34.9	65.0
Wooster	2.32	2.80	30.221	30.773	22d.	29.671	13th.	1.102	84.5	36.0	66.0
Cleveland (S. O.)			30.192	30.726	3d.	29.573	13th.	1.153	76.4	37.0	68.0
Cleveland (Hyde)										88.4	68.8
Akron	0.00	0.00	30.190	30.730	22d.	29.642	13th.	1.088	89.6	36.7	65.1
Hudson											
Weymouth											
Ashland											
Ottawa											
Lordstown											
Tiffin											
Kenton											
Waynesville											
Springboro											
Jacksonburg											
Circleville											
State			30.212	30.830	22d.	29.363	13th.	1.467	84.8	38.8	75.0

The mean atmospheric pressure, 30.212 inches, was .065 inch above the average for the past eight years. The highest barometer, 30.830 inches, occurred at Upper Sandusky on the 22d, and the lowest, 29.363 inches, at Wauseon on the 13th. This was the warmest January on record in the Bureau. The mean temperature of the northern section was 36° 4, of the middle section 38° 1, and of the southern section 41° 9. These means are 12° 1, 12° 2, and 12° 4 above the averages for the sections. The mean for the State, 38° 8, is 12° 2 above the average for January, and 0° 5 above the mean for January, 1829, the highest previous record. The mean temperatures on the 16th, 22d and 24th were below the averages for those days. On all other days of the month the temperatures were above the average. The greatest departure was on the 11th, on which date the temperature was 35° 7 above the average for that day. The maximum temperature reported was 75° at Hanging Rock, on the 12th. This is the highest maximum since 1855. The minimum temperature was 0° 7 above zero at Wauseon on the 22d. The minimum temperature for January, 1839, was 0° 8 above zero. These two years are the only ones since the opening of the Bureau that minimum temperatures below zero have not been reported. The average daily range of temperature was 17° 9. The greatest daily range was 49° 3, at Toledo on the 13th, and the smallest, 3°, at Columbus on the 27th, New Alexandria on the 6th, and Cleveland (S. O.) on the 7th. The mean relative humidity was 84.8 per cent., which is 2 per cent. above the normal. Precipitation was general in all sections on the 1st, 2d, 5th, 6th, 10th, 11th, 12th, 13th, 15th, 16th, 19th, 21st, 23d, 26th and 29th; and in the middle and southern sections on the 4th and 7th. Local rains or snow occurred in all sections on the 8th, 9th, 14th and 25th; in the northern section on the 4th, 7th, 21st, 22d, 24th and 31st, and in the northern and middle sections on the 30th. Snow was reported from stations in the northern section on the 7th, 8th, 9th, 10th, 14th, 15th, 16th, 17th, 21st, 22d, 23d, 24th and

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Date.	Lowest temperature.	Date.	Range of temperature.	Mean daily range of temperature.	Greatest daily range of temperature.	Date.	Least daily range of temperature.	Date.	Number of clear days.	Number of fair days.	Number of cloudy days.	Days on which rain fell, with 0.1 rainfall.	Total rainfall for month.	Average daily rainfall.	Direction of wind.
12th.	10.0	22d.	61.0	14.7	30.0	20th.	4.0	7th.	4	7	20	19	5.28	.170	S. W.
12th.	6.5	22d.	61.5	18.6	40.6	13th.	7.8	30th.	10	15	12	12	4.83	.156	S. W.
12th.	3.0	22d.	63.0	20.2	40.0	13th.	8.0	15th.	7	15	6	6	3.77	.122	S. W.
11th.	.....	.....	59.3	15.8	37.0	13th.	7.2	30th.	9	9	16	10	4.89	.158	S. W.
.....	.....	.....	57.3	16.0	37.5	13th.	6.0	7th.	4	13	14	14	5.78	.186	S. W.
.....	.....	.....	61.3	18.8	39.0	13th.	6.5	7th.	5	15	11	9	5.26	.170	N. W.
11th.	7.5	24th.	.....	.....	.....	.....	.....	.....	5	15	11	18	3.90	.126	S. W.
11th.	7.0	.....	59.6	16.4	38.0	13th.	9.0	7th.	4	12	15	5	3.60	.097	S. W.
11th.	6.0	22d.	.....	.....	.....	.....	.....	.....	3	12	15	12	4.22	.136	S. W.
11th.	4.0	22d.	63.0	19.9	45.3	13th.	6.1	7th.	9	7	18	21	4.14	.134	S. W.
11th.	0.7	22d.	55.3	19.6	44.7	13th.	5.4	7th.	9	7	18	21	6.49	.209	S. W.
13th.	6.1	24th.	61.1	16.9	41.2	13th.	4.3	7th.	9	10	16	15	6.17	.198	S. W.
13th.	3.3	24th.	62.2	18.8	42.5	13th.	8.1	7th.	9	11	15	16	5.20	.168	S. W.
11th.	5.0	22d.	61.0	18.8	32.0	13th.	3.0	30th.	6	12	13	15	5.74	.185	W.
13th.	2.0	22d.	61.5	19.6	40.0	13th.	10.0	7th.	7	5	19	16	3.39	.100	W.
13th.	5.0	22d.	66.0	17.9	49.3	13th.	6.0	16th.	11	14	17	18	3.49	.143	W.
11th.	7.0	22d.	62.0	15.3	31.0	11th.	4.0	3d.	6	2	10	19	3.86	.124	W.
12th.	15.0	22d.	60.0	20.3	42.0	13th.	6.0	6th.	10	14	15	17	5.62	.181	W.
12th.	17.0	22d.	55.0	17.7	35.0	13th.	7.5	3d.	6	10	15	18	4.76	.154	W.
13th.	16.0	22d.	54.0	18.6	38.0	13th.	10.0	.....	4	10	17	19	6.52	.210	W.
13th.	11.0	22d.	56.0	19.1	42.0	13th.	5.0	7th.	9	7	15	18	5.73	.185	W.
13th.	9.0	22d.	58.0	14.7	39.0	13th.	3.0	27th.	9	6	10	15	6.00	.194	W.
13th.	8.5	22d.	59.5	17.6	41.0	13th.	5.0	29th.	5	9	17	19	5.50	.177	W.
11th.	8.0	7th.	56.5	16.4	37.5	13th.	8.0	7th.	4	9	17	15	6.00	.194	W.
12th.	9.0	25th.	60.0	19.9	35.0	13th.	9.0	5th.	4	9	17	12	5.69	.184	E.
13th.	6.0	2 d.	60.0	18.1	41.0	13th.	4.0	7th.	4	10	17	12	4.91	.113	W.
12th.	11.0	22d.	58.0	18.5	29.7	25th.	8.1	21st.	5	9	17	17	4.96	.160	S. W.
12th.	8.9	22d.	61.0	19.8	30.9	25th.	7.5	6th.	7	5	19	14	5.44	.175	W.
13th.	12.5	22d.	.....	.....	.....	.....	.....	.....	6	9	16	14	3.30	.106	W.
12th.	9.8	22d.	.....	.....	.....	.....	.....	.....	2	10	19	16	4.59	.148	S. W.
13th.	7.0	22d.	58.5	18.3	36.5	13th.	5.5	12th.	4	12	15	16	5.50	.177	W.
11th.	6.0	22d.	58.0	16.9	31.0	13th.	3.0	6th.	7	6	18	13	5.04	.163	S. W.
13th.	5.7	22d.	60.3	17.8	39.5	13th.	6.6	7th.	5	9	17	18	3.88	.125	W.
13th.	9.0	22d.	56.0	22.2	37.0	1st	8.0	7th.	5	7	19	15	4.14	.133	W.
13th.	4.0	22d.	61.4	15.9	41.4	13th.	6.4	7th.	3	5	23	17	4.43	.143	W.
13th.	7.0	22d.	58.0	16.7	38.0	13th.	5.0	7th.	3	6	22	22	4.42	.143	W.
13th.	4.5	22d.	61.5	16.8	41.0	13th.	4.5	8th.	7	6	18	16	4.71	.152	W.
13th.	10.9	22d.	58.0	14.9	41.0	5th.	3.0	7th.	3	8	20	20	4.03	.130	W.
13th.	9.5	22d.	59.8	16.2	41.5	13th.	4.0	7th.	4	7	20	20	3.36	.108	W.
13th.	7.0	22d.	58.2	17.2	39.3	13th.	6.6	.....	3	8	20	22	3.99	.129	S. W.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.47	.144	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3.92	.126	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.42	.143	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.24	.137	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3.73	.120	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3.73	.120	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.74	.153	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6.47	.209	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6.15	.198	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5.40	.174	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5.11	.165	.....
12th.	0.7	22d.	71.3	17.9	49.3	13th.	3.0	.....	5.0	9.2	16.9	15.6	4.94	.159	S. W.

29th; in the middle section on the 6th, 7th, 8th, 9th, 10th, 15th, 16th, 21st, 22d, 23d and 26th, and in the southern section on the 9th, 16th, 22d, 23d and 25th. The mean rainfall in the northern section was 3.93 inches, in the middle section 5.27 inches, and in the southern section 5.62 inches. These means are 1.22, 1.68 and 1.87 inches above the averages for the sections. The mean for the State, 4.94 inches, is the heaviest rainfall on record for January, and is 1.59 inches above the average. The greatest monthly rainfall reported from any station, 8.33 inches at West Milton, is the greatest rainfall ever reported from a station of the Bureau for January. Forty-three stations reported rainfall of one inch or more in twenty-four consecutive hours. The smallest monthly rainfall was 1.94 inches, at Vienna. The mean daily rainfall, 0.159 inch is .951 inch above the average for the past eight years. Thunder-storms were reported by Upper Sandusky on the 5th and 13th, Ashland on the 5th, and Portsmouth on the 19th. The highest wind velocities reported during the month were 35 miles S. W. at Cincinnati; 44 miles W. at Columbus; 47 miles S. at Cleveland; 50 miles S. W. at Toledo; 64 miles W. at Ohio State University, and 48 miles S. W. at Sandusky. All the maximum velocities occurred on the 13th, accompanying the storm, then north of the lake region. The greatest daily movement was 667 miles at O. S. University on the 13th, and the least, 51 miles, at Cincinnati on the 18th. Total monthly movement: Cincinnati, 6,445 miles; Columbus, 5,659 miles; Cleveland, 7,795 miles; Toledo, 8,317 miles; O. S. University, 9,762 miles, and Sandusky 8,407 miles. The prevailing direction of wind was southwest. The percentage of verifications of weather signals received from Washington, and distributed to thirty-two display stations (computed from the reports of observers) was eighty-eight for weather and eighty six for temperature. Cold wave signals were ordered on the 1st, 6th, 11th, 12th, 15th, 20th and 31st. The signals of the 12th, 15th and 20th were justified.

METEOROLOGICAL OBSERVATIONS FOR THE MONTH OF FEBRUARY, 1890, FURNISHED

Stations.	Ozone. Monthly mean.		Mean barometer.	Highest barometer.	Date.	Lowest barometer.	Date.	Range of barometer.	Mean relative humidity.	Mean temperature.	Highest temperature.
	7 A. M. to 2 P. M.	9 P. M. to 7 A. M.									
Cincinnati.....			30.100	30.497	21st.	29.530	14th.	.967	76.5	43.1	70.0
Dayton.....	0.85	1.42	30.083	30.496	21st.	29.521	14th.	.975	82.4	41.0	68.0
Wapakoneta.....			30.153	30.530	21st.	29.588	14th.	.942	90.1	37.9	65.0
Sidney.....			30.032	30.362	21st.	29.428	14th.	.984	84.8	39.7	64.0
Greenville.....	3.85	4.50	30.116	30.604	21st.	29.503	14th.	1.001	84.3	38.2	65.0
Celina.....	0.00	0.00	30.081	30.495	9th.	29.512	14th.	.983	82.7	39.8	67.0
Upper Sandusky.....	3.93	4.11	30.100	30.525	10th.	29.543	14th.	.982	85.3	38.6	65.0
Fostoria.....			30.078	30.540	9th.	29.525	14th.	1.015	85.6	37.1	65.5
Findlay.....			30.104	30.523	1st.	29.537	14th.	.986	87.0	36.7	65.9
Wauseon.....	2.57	2.68	30.067	30.519	9th.	29.520	19th.	.999	80.8	32.9	63.6
Clarksville.....	4.22	4.54	30.114	30.507	21st.	29.556	14th.	.951	82.8	40.3	63.1
Yellow Springs.....			30.083	30.485	9th.	29.515	14th.	.970		39.4	66.4
North Lewisburg.....			30.117	30.500	1st.	29.580	14th.	.920	80.7	39.4	67.0
Bangorville.....			28.626	28.955	9th.	28.190	14th.	.755	75.8	36.6	64.0
Toledo.....			30.082	30.498	1st.	29.558	14th.	.940	78.7	36.4	67.0
Sandusky.....			30.080	30.509	1st.	29.536	14th.	.973	78.3	36.0	63.0
Hanging Rock.....	0.00	0.61	30.088	30.144	9th.	29.613	14th.	.831	90.8	41.0	73.0
Portsmouth.....			30.124	30.511	9th.	29.617	14th.	.894	81.9	45.3	72.0
Waverly.....			30.084	30.464	9th.	29.483	14th.	.981	81.1	44.7	71.0
Georgetown.....			30.090	30.481	9th.	29.569	14th.	.912	84.8	42.3	68.0
Columbus.....			30.098	30.545	9th.	29.502	14th.	1.003	74.6	40.6	66.0
O. S. University.....			30.074	30.498	9th.	29.488	14th.	1.010	80.7	39.9	66.0
Westerville.....	2.04	1.89	30.059	30.464	9th.	29.483	14th.	.981	86.0	38.9	65.0
Logan.....			30.117	30.540	9th.	29.539	14th.	1.001	85.9	41.7	70.0
Oberlin.....			30.125	30.546	9th.	29.535	14th.	1.011	85.5	36.7	64.0
Marietta.....			30.108	30.513	9th.	29.556	14th.	.957	79.3	43.3	68.2
McConnellsville.....			30.073	30.517	9th.	29.510	14th.	1.007	81.8	43.1	69.4
Pomeroy.....			30.098	30.490	9th.	29.642	14th.	.848	88.2	46.3	69.0
Athens.....			30.071	30.468	9th.	29.572	14th.	.896	81.4	42.6	70.0
Granville.....			30.085	30.494	9th.	29.491	14th.	1.003	85.9	39.2	65.0
Newcomertown.....			30.074	30.487	9th.	29.541	14th.	.946	85.5	39.1	64.5
New Alexandria.....									81.1	40.5	64.0
Canton.....			30.078	30.496	1st.	29.495	14th.	1.001		37.2	64.8
Youngstown.....	0.97	1.28	30.066	30.471	1st.	29.485	14th.	.986	84.8	38.3	65.0
Hiram.....			30.083	30.489	10th.	29.487	14th.	1.002	87.1	34.4	62.0
Jefferson.....			30.038	30.482	1st.	29.411	14th.	1.071	86.6	34.3	63.0
Wooster.....	2.93	2.93	30.100	30.526	10th.	29.539	14th.	.987	81.4	36.6	64.5
Cleveland (S. O.).....			30.090	30.497	1st.	29.552	14th.	.945	77.4	36.3	65.0
Cleveland (Hyde).....									37.2	37.2	65.2
Akron.....	0.00	0.00	30.065	30.497	1st.	29.509	14th.	.988	88.1	36.9	63.7
Hudson.....											
Weymouth.....											
Ashland.....											
Ottawa.....											
Lordstown.....											
Tiffin.....											
Kenton.....											
Waynesville.....											
Springboro.....											
Jacksonburg.....											
Circleville.....											
State.....			30.092	30.546	9th.	29.411	14th.	1.135	83.2	39.4	73.0

The mean atmospheric pressure, 30.092 inches, was .040 inch below the eight-year average for February. The highest barometer, 30.546 inches, occurred at Oberlin on the 9th, and the lowest, 29.411 inches, at Jefferson on the 14th. This was the warmest February on record in the Bureau. The mean temperature, 36° 4, is 9° 2 above the eight-year average and 4° 5 above the mean in 1887, the highest previous record. The highest temperature reported during the month was 75° at Hanging Rock, on the 4th, and the lowest, 5° above zero at Wauseon on the 9th. This is the only February, since the opening of the Bureau in 1882, that minimum temperatures below zero have not been reported. The mean relative humidity, 83.2 per cent., was slightly above the normal. Precipitation was general in all sections on the 3d, 7th, 8th, 14th, 19th, 20th, 23d, 24th, 25th, 27th and 28th; in the northern and middle sections on the 14th and 15th, and in the southern section on the 1st. Local rains or snows occurred in all sections on the 2d, 18th, 21st, 22d and 26th, and in the northern section on the 5th, 9th, 13th and 17th. The precipitation was in the form of snow on the 1st, 7th, 8th, 9th, 14th, 15th, 20th, 21st, 22d and 23d in the northern section; on the 1st, 7th, 8th, 20th, 21st, 22d, 23d, 27th and 28th in the middle section, and on the 1st, 6th, 7th, 8th, 16th, 20th, 21st, 22d and 23d in the south-

THE STATE BOARD OF HEALTH BY THE OHIO METEOROLOGICAL BUREAU.

Date.	Lowest temperature.	Date.	Range of temperature.	Mean daily range of temperature.	Greatest daily range of temperature.	Date.	Least daily range of temperature.	Date.	Number of clear days.	Number of fair days.	Number of cloudy days.	Days on which rain fell, with 0.1 rainfall.	Total rainfall for month.	Average daily rainfall.	Direction of wind.
4th.	18.0	9th.	52.0	17.6	36.0	17th.	5.0	1st.	6	3	19	14	4.63	.165	W.
4th.	15.5	21st.	52.5	18.7	29.6	13th.	8.0	25th.	7	5	16	8	5.09	.182	W.
3d.	13.0	21st.	52.0	19.7	32.8	24th.	10.0	25th.	7	6	15	8	5.11	.182	W.
4th.	15.0	21st.	49.1	16.4	36.0	11th.	6.7	14th.	7	6	15	9	4.98	.184	W.
4th.	14.0	21st.	51.0	16.8	25.0	5th.	6.0	14th.	6	4	18	12	4.71	.168	W.
5th.	14.0	21st.	53.0	18.6	28.0	20th.	9.0	7th.	6	6	16	10	4.76	.170	W.
4th.	13.0	21st.	52.0	19.8	29.0	.....	11.0	14th.	8	4	16	12	4.96	.177	W.
4th.	11.5	9th.	54.0	20.3	33.0	24th.	7.0	14th.	6	8	14	7	4.92	.176	W.
4th.	10.0	9th.	55.9	19.4	34.5	5th.	9.0	14th.	7	5	16	8	4.76	.170	W.
4th.	.....	9th.	58.6	18.2	35.9	11th.	5.3	14th.	6	5	17	16	3.43	.123	W.
4th.	17.5	9th.	50.6	17.5	33.2	28th.	2.0	1st.	7	6	15	12	4.31	.154	W.
4th.	12.9	21st.	53.1	19.1	32.2	28th.	8.0	14th.	6	3	19	12	6.04	.216	W.
24th.	12.9	9th.	55.0	20.6	40.0	10th.	9.0	2d.	6	5	17	9	5.95	.214	W.
4th.	10.5	9th.	53.5	20.0	33.4	5th.	9.3	2d.	6	5	17	10	6.05	.216	W.
4th.	13.0	9th.	54.0	16.5	30.0	4th.	6.0	12th.	6	9	13	14	2.90	.104	W.
25th.	12.0	21st.	56.0	14.1	30.0	.....	4.0	12th.	5	5	18	15	3.10	.111	W.
4th.	19.0	.....	54.0	21.1	38.0	11th.	7.0	25th.	6	4	18	16	7.22	.258	W.
4th.	22.0	9th.	50.0	20.0	37.8	13th.	4.0	1st.	4	7	17	14	7.01	.250	W.
4th.	21.0	9th.	50.0	19.4	38.5	11th.	2.5	1st.	7	5	16	15	3.91	.140	W.
4th.	17.0	9th.	51.0	19.6	41.0	13th.	8.0	25th.	7	8	13	16	7.08	.253	W.
4th.	17.0	9th.	49.0	14.1	29.0	.....	3.0	.....	7	5	16	16	6.12	.219	W.
4th.	16.0	9th.	50.0	17.2	35.0	11th.	5.9	.....	7	7	14	14	5.93	.212	W.
4th.	16.5	9th.	48.5	16.1	30.5	13th.	8.0	4th.	5	5	18	10	5.32	.190	W.
4th.	15.0	.....	55.0	21.0	43.0	17th.	3.0	1st.	6	5	17	13	5.47	.195	W.
.....	14.0	21st.	50.0	18.5	37.0	5th.	7.0	.....	8	6	14	9	4.46	.159	W.
18th.	16.8	9th.	51.4	20.1	34.7	13th.	11.0	14th.	3	12	13	12	4.96	.177	W.
4th.	13.8	9th.	55.6	20.6	39.1	13th.	6.8	1st.	5	5	18	13	5.08	.181	W.
18th.	17.0	10th.	52.0	20.1	36.0	13th.	7.0	25th.	8	2	17	14	5.16	.184	W.
4th.	15.5	9th.	54.5	22.5	40.0	13th.	9.0	25th.	7	7	11	15	5.37	.192	W.
4th.	14.9	9th.	50.1	17.9	33.0	28th.	8.0	.....	5	5	18	8	6.36	.227	W.
4th.	14.0	9th.	50.5	18.9	33.5	18th.	8.0	.....	6	6	16	10	6.00	.214	W.
4th.	13.0	21st.	50.0	16.8	30.0	13th.	8.0	14th.	7	5	16	11	5.82	.208	W.
4th.	14.0	21st.	50.8	17.7	36.0	28th.	8.0	6th.	5	6	17	13	6.17	.220	W.
4th.	13.0	21st.	52.0	20.4	36.0	5th.	8.0	.....	4	7	17	8	4.89	.175	W.
5th.	13.8	10th.	58.2	20.1	37.5	5th.	4.4	21st.	4	4	20	10	4.68	.167	W.
.....	14.0	21st.	49.0	17.8	37.0	5th.	4.0	9th.	4	5	19	13	4.26	.152	W.
4th.	14.0	21st.	50.5	17.9	33.5	5th.	6.5	.....	4	5	19	11	6.20	.221	W.
4th.	15.0	21st.	50.0	14.8	26.0	4th.	4.0	.....	5	5	18	15	4.58	.164	W.
5th.	15.0	21st.	50.2	16.2	36.2	5th.	2.0	9th.	4	6	18	14	4.19	.150	W.
4th.	12.6	21st.	51.1	18.2	36.6	5th.	8.4	9th.	5	6	17	15	4.90	.178	W.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5.10	.182	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.93	.176	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5.50	.196	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3.70	.132	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.40	.157	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.25	.152	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.63	.165	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5.26	.188	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5.21	.186	.....
.....															
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5.28	.188	.....
4th.	5.0	9th.	68.0	18.6	46.0	17th.	2.0	9th.	5.8	5.6	16.6	12.1	5.25	.188	S. W.

ern section. Thunder storms were general in all sections on the 19th, 20th and 25th, and local in the middle and southern sections on the 3d, 4th, 8th, 17th, 19th and 24th. The mean rainfall in the northern section was 4.57 inches, in the middle section 5.63 inches, and in the southern section 5.56 inches. These means are 1.15, 1.86 and 1.29 inches above the averages for the sections. The mean for the State, 5.25 inches, is 1.43 inches above the average for February. The greatest monthly rainfall reported was 7.22 inches at Hanging Rock, and the smallest, 2.90 inches, at Toledo. Fifty-seven stations reported rainfall of one inch or more in twenty-four consecutive hours. The highest wind velocities reported during the month were 27 miles N. W. at Cincinnati; 30 miles S. W. at Columbus; 60 miles N. at Toledo, and 46 miles N. W. at Ohio State University on the 20th, and 36 miles S. W. at Cleveland on the 4th. The greatest daily movement was 568 miles at Ohio State University on the 20th, and the least, 50 miles, at Cincinnati on the 18th. The prevailing direction of the wind was southwest.

METEOROLOGICAL OBSERVATIONS FOR THE MONTH OF MARCH, 1890, FURNISHED

Stations.	Ozone. Monthly mean.		Mean barometer.	Highest barometer.	Date.	Lowest barometer.	Date.	Range of barometer.	Mean relative humidity.	Mean temperature.	Highest temperature.
	7 A. M. to 2 P. M.	9 P. M. to 7 A. M.									
Cincinnati			30.116	30.527	9th.	29.423	27th.	1.099	72.6	39.7	67.0
Dayton	1.58	2.62	30.105	30.542	9th.	29.348	27th.	1.194	79.7	36.9	64.0
Wapakoneta			30.157	30.596	8th.	29.341	28th.	1.255		33.8	58.0
Sidney											
Greenville	4.29	5.13	30.101	30.540	8th.	29.356	28th.	1.184	84.3	34.1	58.2
Celina			30.107	30.555	9th.	29.339	28th.	1.216	82.5	35.1	63.0
Upper Sandusky	4.45	4.84	30.102	30.550	9th.	29.400	28th.	1.150	90.1	34.1	59.0
Fostoria									86.9	33.8	62.0
Findlay			30.094	30.574	9th.	29.244	28th.	1.330	87.6	32.7	59.5
Wauseon	2.35	2.23	30.084	30.568	9th.	29.242	28th.	1.326	76.0	30.8	60.6
Clarksville	3.93	4.52	30.138	30.582	9th.	29.351	27th.	1.231	76.0	34.9	63.3
Yellow Springs				30.521	8th.	29.366	27th.	1.158			60.6
North Lewisburg			30.111	30.480	8th.	29.412	28th.	1.068	78.0	35.0	66.0
Bangorville			23.617	29.031	8th.	27.844	28th.	1.190	72.7	31.1	59.5
Toledo			30.090	30.557	9th.	29.246	28th.	1.311	72.2	32.4	60.0
Sandusky	0.36	0.97	30.050	30.530	9th.	29.220	28th.	1.360	65.0	32.0	60.0
Hanging Rock	0.13	0.63	30.117	30.523	9th.	29.396	28th.	1.127	87.7	37.7	68.0
Portsmouth			30.143	30.574	9th.	29.479	27th.	1.085	77.5	39.9	68.5
Waverly			30.077	30.524	9th.	29.316	28th.	1.208	78.2	39.3	65.5
Georgetown			30.116	30.521	9th.	29.313	27th.	1.178	85.7	36.6	66.5
Columbus			30.114	30.557	9th.	29.407	28th.	1.150	72.8	35.2	62.0
O. S. University			30.096	30.566	9th.	29.286	27th.	1.280	77.3	34.3	63.0
Westerville	2.87	2.84	30.079	30.553	9th.	29.331	28th.	1.252	85.0	34.9	62.0
Logan			30.131	30.627	9th.	29.455	28th.	1.172	83.5	36.3	67.0
Oberlin			30.115	30.615	9th.	29.259	28th.	1.356	85.3	32.1	59.0
Marietta			30.122	30.616	9th.	29.371	28th.	1.245	76.8	37.1	67.2
McConnellsville			30.096	30.545	9th.	29.346	28th.	1.191	82.8	35.8	65.3
Pomeroy			30.111	30.568	9th.	29.423	28th.	1.140	89.1	40.6	69.0
Athens			30.033	30.576	9th.	29.378	28th.	1.198	87.2	36.6	66.8
Granville											
Newcomerstown			30.091	30.595	9th.	29.280	28th.	1.315	82.1	33.4	62.0
New Alexandria									78.7	33.4	62.0
Canton			30.092	30.616	9th.	29.251	28th.	1.365		32.2	61.5
Youngstown			30.062	30.493	9th.	29.262	28th.	1.131	83.7	33.1	60.1
Hiram			3.075	30.593	9th.	29.274	28th.	1.325	88.0	28.8	58.2
Jefferson			30.047	30.595	9th.	29.260	28th.	1.335	88.7	29.0	59.0
Wooster	4.00	3.36	30.116	30.641	9th.	29.263	28th.	1.378	79.5	39.9	60.0
Cleveland (S. O.)			30.102	30.605	9th.	29.235	28th.	1.370	74.4	32.0	61.5
Cleveland (Hyde)										33.2	61.5
Akron	0.00	0.00	30.056	30.600	9th.	29.251	23th.	1.349	86.0	31.3	59.0
Hudson											
Weymouth											
Ashland											
Ottawa											
Lordstown											
Tiffin											
Kenton											
Waynesville											
Springboro											
Jacksonburg											
Circleville											
State			30.101	30.641	9th.	29.220	28th.	1.421	81.3	34.5	69.0

The mean atmospheric pressure, 30.101 inches, was 40 inch above the average for March. The highest barometer, 30.641 inches, occurred at Wooster on the 9th, and the lowest, 29.220 inches, at Sandusky on the 28th. The mean temperature, 31° 9'; of the middle section, 33° 9'; of the southern section, 37° 6, and of the State, 34° 5. These means are 1° 6, 1° 4, 1° 2 and 1° 4 below the averages for the sections and State for March. The highest temperature reported during the month was 69° at Hanging Rock, on the 11th, and at Pomeroy on the 14th. The minimum temperature reported during the month was 4° below zero at Jefferson on the 7th. This is the lowest temperature during the past winter. The mean daily range of temperature was 16° 3. The greatest daily range was 37° at North Lewisburg on the 9th, and the least 3° at Cleveland on the 2d, and at Columbus and O. S. University on the 31st. The mean relative humidity, 81.3 per cent., was above the average. Precipitation was general in all sections on the 5th, 10th, 11th, 12th, 13th, 19th, 21st, 22d, 25th, 27th, 23th, 29th and 30th; in the northern section on the 4th, 15th, 16th, 17th and 20th; in the middle section on the 4th and 15th, and in the southern section on the 31st. Local rains or snows occurred in all sections on the 1st, 2d, 6th, 14th, 18th and 24th. The mean rainfall in the northern section was 3.82 inches; in

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Date.	Lowest temperature.		Range of temperature.		Mean daily range of temperature.		Greatest daily range of temperature.		Date.		Least daily range of temperature.		Date.		Number of clear days.		Number of fair days.		Number of cloudy days.		Days on which rain fell, with 0.1 rainfall.		Total rainfall for month.		Average daily rainfall.		Direction of wind.	
25th.	7.0	6th.	60.0	17.4	31.0	28th.	6.0	27th.	1	11	19	15	6.26	.202	N. E.													
21st.	3.2	6th.	60.8	16.5	26.0	9th.	5.5	31st.	4	10	17	16	4.34	.140	N.W.													
.....	4.0	6th.	54.0	16.4	29.0	.....	5.2	10th.	8	14	9	12	9.58	.309	N.W.													
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.94	.159	.....													
21st.	4.0	6th.	54.2	14.0	22.8	15th.	4.0	10th.	3	14	14	16	3.99	.129	W.													
21st.	5.0	6th.	58.0	18.2	28.2	17th.	8.0	1st.	3	13	15	9	3.56	.115	N.W.													
.....	4.0	6th.	55.0	15.0	25.0	20th.	5.0	1st.	2	9	20	17	3.89	.125	W.													
21st.	4.0	6th.	58.0	16.8	32.0	9th.	4.0	29th.	4	14	13	8	4.22	.136	W.													
21st.	2.5	6th.	57.0	15.5	28.0	9th.	5.1	1st.	5	15	11	10	3.94	.127	N.W.													
21st.	-0.3	6th.	60.9	13.1	35.2	9th.	4.6	10th.	4	16	11	17	3.46	.111	N.W.													
21st.	2.9	6th.	60.4	15.5	27.2	9th.	9.0	1st.	3	11	17	17	6.57	.212	N.W.													
25th.	1.5	6th.	59.1	.....	24.5	28th.	9.4	1st.	.....	.....	.....	.....	14	5.35	.173													
21st.	2.5	6th.	63.5	18.4	37.0	9th.	8.0	10th.	6	14	11	11	4.90	.158	W.													
.....	2.0	6th.	57.5	18.0	28.0	20th.	7.0	.....	4	10	17	16	5.11	.165	S. W.													
21st.	6.0	6th.	54.0	14.8	26.0	24th.	6.0	22d.	4	15	12	13	1.56	.051	N.W.													
25th.	8.0	7th.	52.0	12.0	25.0	20th.	4.0	26th.	2	7	22	22	2.78	.090	N.W.													
11th.	3.0	6th.	66.0	19.6	26.0	9th.	7.0	31st.	5	9	17	16	8.40	.271	N.W.													
12th.	10.0	6th.	58.5	19.0	33.0	9th.	7.5	.....	6	9	16	20	8.40	.271	S. W.													
.....	10.5	6th.	55.0	17.1	34.0	9th.	8.5	.....	5	8	18	17	6.70	.216	S. W.													
25th.	2.5	6th.	64.0	18.9	36.5	9th.	7.0	.....	7	7	17	15	7.24	.234	S. W.													
25th.	7.0	6th.	55.0	13.6	28.0	20th.	3.0	31st.	4	9	18	19	5.63	.182	W.													
21st.	4.0	6th.	59.0	15.3	28.0	.....	3.0	31st.	5	12	14	17	1.84	.156	S. W.													
21st.	5.0	*3	57.0	15.0	27.0	9th.	5.0	2d.	6	5	20	16	4.50	.145	S.													
12th.	3.0	6th.	64.0	19.3	35.0	9th.	7.0	.....	4	8	19	14	6.61	.213	N.W.													
Zero.	7th.	59.0	14.8	30.0	9th.	4.0	2d.	10	15	6	10	4.14	.134	W.														
12th.	-2.0	7th.	69.2	18.9	36.0	9th.	7.6	31st.	3	7	21	17	6.62	.214	N.W.													
12th.	-1.0	7th.	66.3	18.6	33.0	29th.	5.4	2d.	5	4	22	13	5.33	.172	N.													
14th.	8.0	*3	61.0	18.5	30.0	.....	7.0	21st.	6	9	16	16	6.47	.209	W.													
12th.	-1.0	7th.	67.8	20.5	35.2	6th.	7.7	31st.	5	6	20	15	6.38	.206	N.W.													
.....																												
21st.	-2.0	7th.	64.0	17.7	33.5	20th.	5.0	31st.	3	14	14	13	5.39	.174	W.													
12th.	-1.0	7th.	63.0	16.6	30.0	9th.	7.0	31st.	5	8	18	16	5.47	.176	W.													
12th.	0.5	7th.	61.0	16.2	28.5	9th.	7.3	31st.	5	12	14	16	3.73	.120	W.													
12th.	-2.0	7th.	62.1	19.9	32.0	.....	9.0	31st.	5	9	17	9	4.38	.141	N.													
13th.	Zero.	7th.	58.2	15.8	27.5	9th.	5.8	13th.	5	13	13	14	3.76	.121	W.													
12th.	-4.0	7th.	63.0	14.6	33.0	9th.	6.0	13th.	3	12	16	21	5.02	.162	N.W.													
21st.	1.0	7th.	59.0	15.8	31.0	9th.	5.0	1st.	6	11	14	16	4.37	.141	N.W.													
25th.	6.0	7th.	55.5	11.6	28.0	9th.	3.0	2d.	4	7	20	18	3.93	.127	N.W.													
25th.	6.0	7th.	55.5	13.7	28.0	9th.	5.7	2d.	3	11	17	16	3.82	.123	S.													
25th.	3.5	7th.	55.5	15.7	28.8	9th.	6.7	10th.	2	11	18	20	4.03	.130	S.													
.....																												
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.60	.148	.....													
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3.89	.125	.....													
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.45	.143	.....													
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3.81	.123	.....													
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.30	.139	.....													
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5.85	.189	.....													
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5.95	.192	.....													
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6.04	.195	.....													
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5.75	.185	.....													
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6.80	.203	.....													
11th.	-4.0	7th.	73.0	16.3	37.0	9th.	3.0	2d.	4.5	10.5	16.0	15.2	5.29	.171	N.W.													

the middle section, 5.43 inches, and in the southern section, 6.62 inches. These means are 1.50, 2.54 and 3.67 inches above the averages for the sections. The mean for the State, 5.29 inches, is 2.56 inches above the average for March. The greatest monthly rainfall was 9.58 inches at Wapakoneta, and the smallest, 1.56 inches, at Toledo. The greatest rainfall reported in any twenty-four hours was 3.07 inches at Hanging Rock on the 21st and 22d. Forty stations reported rainfall of one inch or more in twenty-four consecutive hours. The highest wind velocities reported during the month were 38 miles S. W. at Cincinnati; 38 miles S. W. at Columbus; 31 miles E. at Cleveland; 43 miles N. E. at Toledo; 60 miles S. W. at Ohio State University, and 42 miles N. W. at Sandusky. These high winds all accompanied the severe storm of the 28th, whose center passed over the northern part of the State. Toledo also reported a maximum velocity of 43 miles S. W. on the 25th. The greatest daily movement was 782 miles at Ohio State University on the 28th, and the least, 50 miles, at Cincinnati on the 18th. Total movement—Cincinnati, 5,666 miles; Columbus, 6,997 miles; Cleveland, 6,725 miles; Toledo, 8,669 miles; Ohio State University, 10,609 miles, and Sandusky, 3,524 miles.

METEOROLOGICAL OBSERVATIONS FOR THE MONTH OF APRIL, 1890, FURNISHED

Stations.	Ozone. Monthly mean.		Mean barometer.	Highest barometer.	Date.	Lowest barometer.	Date.	Range of barometer.	Mean relative humidity.	Mean temperature.	Highest temperature.
	7 A. M. to 2 P. M.	9 P. M. to 7 A. M.									
Cincinnati			30.126	30.497	1st.	29.552	8th.	.945	59.6	55.8	80.0
Dayton	1.62	1.17	30.111	30.525	1st	29.482	9th.	1.043	72.6	53.8	76.5
Wapakoneta			30.154	30.511	20th.	29.522	8th.	.989	85.4	49.9	75.5
Sidney				30.555	1st.	29.456	8th.	1.099			73.6
Greenville	1.73	4.63	30.104	30.508	20th.	29.470	9th.	1.038	81.5	51.5	73.5
Celina			30.113	30.538	20th.	29.438	9th.	1.100	74.8	52.4	78.0
Upper Sandusky...	5.27	5.40	30.096	30.516	1st.	29.402	9th.	1.114	84.0	50.6	76.0
Fostoria									76.4	51.0	78.0
Findlay			30.111	30.576	1st.	29.381	9th.	1.195	80.6	49.3	76.0
Wauseon	2.07	2.20	30.106	30.564	1st.	29.338	9th.	1.226	65.0	48.5	77.5
Clarksville	3.97	4.37	30.135	30.520	1st.	29.516	9th.	.974	73.6	53.2	76.4
Yellow Springs			30.119	30.524	1st.	29.520	9th.	1.004	70.8	52.3	72.6
North Lewisburg			30.168	30.525	1st.	29.562	9th.	.963	71.7	53.6	78.0
Bangorville			28.679	29.080	1st.	28.054	9th.	1.026	70.1	48.8	73.0
Toledo			30.130	30.572	20th.	29.346	9th.	1.276	65.9	47.7	75.0
Sandusky	.27	1.23	30.119	30.591	1st.	29.380	9th.	1.211	63.0	47.0	84.0
Hanging Rock	0.67	1.23	30.119	30.476	20th.	29.534	9th.	.942	84.1	53.5	81.0
Portsmouth			30.159	30.533	2d.	29.529	9th.	1.004	76.8	55.4	86.0
Waverly			30.135	30.508	2d.	29.499	9th.	1.009	75.8	56.1	81.5
Georgetown			30.118	30.490	2d.	29.533	9th.	.957	78.8	54.7	81.0
Columbus			30.122	30.528	2d.	29.461	9th.	1.067	64.7	52.3	75.0
O. S. University			30.106	30.521		29.456	9th.	1.065	70.1	52.6	75.0
Westerville	3.67	2.54	30.090	30.530	2d.	29.430	9th.	1.090	75.0	51.0	75.0
Logan			30.135	30.567	2d.	29.433	9th.	1.084	73.8	53.7	80.0
Oberlin									86.0	48.2	74.0
Marietta			30.136	30.579	2d.	29.536	9th.	1.043	73.5	54.0	81.0
McConnellsville			30.144	30.544	2d.	29.453	9th.	1.086	77.6	52.6	79.7
Pomeroy			30.118	30.507	1st.	29.560	9th.	.947	76.7	57.8	81.0
Athens			30.099	30.507	2d.	29.489	9th.	1.018	73.0	53.2	80.0
Newcomerstown			30.115	30.563	1st.	29.479	9th.	1.034	78.0	49.2	77.0
New Alexandria									71.9	51.8	75.0
Canton			30.112	39.584	1st.	29.417	9th.	1.167		49.2	74.2
Youngstown	1.26	1.43		30.582	21st.	29.376	9th.	1.196			75.5
Hiram			30.117	30.587	1st.	29.352	9th.	1.235	70.8	46.8	75.0
Jefferson			30.123	30.588	1st.	29.259	9th.	1.229	74.2	46.0	76.0
Wooster	4.20	3.13	30.131	30.622	1st.	29.171	9th.	1.151	71.5	48.4	74.0
Cleveland (S. O.)			30.134	30.603	1st.	29.374	9th.	1.229	69.1	46.6	76.0
Cleveland (Hyde)										48.2	76.5
Akron	.13	.03	30.109	30.538	1st.	29.403	9th.	1.185	75.0	48.5	74.0
Hudson											
Weymouth											
Ellsworth											
Ashland											
Ottawa											
Lordstown											
Tiffin											
Kenton											
Waynesville											
Springboro											
Jacksonburg											
Circleville											
State			30.121	30.622	1st.	29.259	9th.	1.363	74.2	51.3	86.0

The mean atmospheric pressure, 30.121 inches, was .031 inch above the average for April. The highest barometer, 30.622 inches, occurred at Wooster on the 1st. This is the highest record for April. The lowest, 29.259 inches, at Jefferson on the 9th. The mean temperature of the northern section was 48° 3; of the middle section, 51° 3; of the southern section, 54° 2, and of the State, 51° 3. These means are 1° 4, 1° 4, 1° 7 and 1° 5 above the averages for the sections and State for April. The highest temperature reported during the month was 86° at Portsmouth on the 8th, and the lowest, 20°, at Youngstown, on the 2d, and at Findlay, on the 10th. The mean daily range of temperature was 22° 7. The greatest daily range was 49° 5 at Yellow Springs on the 11th, and the least 3° at New Alexandria on the 24th. The mean relative humidity, 74.2 per cent., was 1.6 per cent. above the average. Precipitation was general in all sections on the 3d, 4th, 8th, 9th, 10th, 14th, 23d, 24th, 26th and 27th; in the northern section on the 7th and 17th, and in the southern section on the 13th, 15th, 17th and 25th. Local rains occurred in all sections on the 29th; in the northern and middle sections on the 13th and 25th, and in the southern section on the 5th. The mean rainfall in the northern section was 3.73 inches; in the middle section, 3.58 inches, and in the southern section, 2.93 inches.

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Date.	Lowest temperature.	Date.	Range of temperature.	Mean daily range of temperature.	Greatest daily range of temperature.	Date.	Least daily range of temperature.	Date.	Number of clear days.	Number of fair days.	Number of cloudy days.	Days on which rain fell, with 0.1 rainfall.	Total rainfall for month.	Average daily rainfall.	Direction of wind.
8th.	31.0	1st.	49.0	20.0	35.0	6th.	7.0	15th.	7	10	13	17	2.63	.688	N.E.
8th.	28.0	1st.	48.5	21.7	34.5	21st.	7.0	23d.	12	11	10	8	2.70	.690	S.W.
23d.	26.0	1st.	49.5	24.8	37.0	21st.	12.0	23d.	17	3	10	1	1.65	.956	S.W.
8th.	29.1	1st.	44.5	.....	30.1	2d.	5.9	23d.	.....	.....	.....	.....	3.22	.....	S.
.....	26.5	1st.	47.0	19.8	31.5	21st.	6.2	3d.	11	11	8	12	3.37	.....	.....
22d.	29.0	1st.	49.0	22.8	35.2	20th.	9.0	3d.	12	8	10	5	3.98	.....	N.E.
22d.	25.0	1st.	51.0	21.6	35.0	21st.	11.0	.....	11	11	8	10	3.55	.....	N.E.
22d.	24.5	1st.	53.5	25.6	44.0	1st.	10.0	10th.	11	11	10	4	2.85	.....	N.E.
.....	20.0	10th.	56.0	23.4	38.0	21st.	8.8	15th.	13	10	7	9	4.60	.....	N.E.
22d.	21.4	1st.	56.1	26.0	47.0	21st.	7.3	20th.	10	11	9	11	5.22	.....	N.E.
8th.	28.3	11th.	49.1	20.6	34.5	11th.	8.2	23d.	11	10	9	14	3.11	.....	E.
8th.	50.2	11th.	52.4	24.8	49.5	11th.	7.6	.....	.....	.....	.....	10	2.82	.....	.....
22d.	25.0	.....	53.0	23.2	37.0	2d.	11.0	3d.	11	7	9	9	2.55	.....	S.W.
13th.	23.5	.....	50.0	23.3	33.8	11th.	11.2	23d.	11	11	8	10	2.92	.....	N.E.
22d.	26.0	1st.	49.0	18.4	31.0	8th.	6.0	26th.	11	12	7	11	4.05	.....	N.E.
8th.	26.0	2d.	58.0	15.8	44.0	8th.	4.0	15th.	5	12	13	12	3.68	.....	E.
26th.	27.0	.....	54.0	21.7	44.0	21st.	8.0	.....	9	10	11	14	3.67	.....	N.E.
8th.	32.0	.....	54.0	25.2	44.5	11th.	7.5	15th.	13	7	10	14	3.24	.....	N.E.
8th.	31.5	.....	50.0	24.2	39.0	25th.	9.5	15th.	12	7	10	14	2.59	.....	S.W.
8th.	28.0	11th.	53.0	23.7	39.5	21st.	8.0	15th.	11	2	17	14	2.94	.....	N.E.
22d.	28.0	1st.	47.0	19.4	31.0	6th.	4.0	4th.	12	5	12	12	4.32	.....	N.E.
.....	27.0	1st.	48.0	23.1	36.0	.....	9.0	15th.	13	7	10	11	3.99	.....	N.E.
22d.	26.0	1st.	49.0	22.6	34.5	.....	10.5	15th.	11	7	12	12	2.77	.....	S.
8th.	24.0	2d.	56.0	28.1	48.0	6th.	12.0	10th.	12	12	6	10	2.93	.....	N.E.
18th.	23.0	2d.	51.0	20.7	31.0	.....	6.0	10th.	13	10	7	8	3.73	.....	N.
8th.	26.6	2d.	54.4	25.7	41.0	.....	6.9	24th.	8	10	12	11	3.29	.....	N.W.
8th.	24.1	2d.	55.6	22.6	41.1	2d.	9.2	24th.	10	7	13	11	2.53	.....	N.
8th.	29.0	11th.	52.0	26.0	41.0	6th.	13.0	27th.	13	6	11	13	4.79	.....	W.
8th.	22.8	19th.	57.2	28.7	46.8	12th.	10.8	15th.	11	10	9	10	2.71	.....	N.W.
.....	23.0	.....	54.0	26.6	42.0	22d.	9.0	10th.	13	7	10	8	3.43	.....	W.
13th.	22.0	1st.	53.0	22.9	35.0	.....	3.0	24th.	15	4	11	7	4.51	.....	S.
13th.	24.0	1st.	50.2	24.0	37.0	.....	9.4	10th.	14	12	4	12	3.87	.....	S.
12th.	20.0	2d.	55.5	.....	34.0	21st.	6.0	6th.	.....	.....	.....	7	3.52	.....	S.
12th.	22.2	2d.	52.8	22.5	35.7	9th.	4.6	23d.	16	4	10	12	3.23	.....	S.W.
12th.	22.0	2d.	54.0	22.2	34.0	22d.	7.0	10th.	15	6	9	11	8.79	.....	S.
.....	23.0	2d.	51.0	23.2	35.0	21st.	10.0	10th.	11	12	7	10	3.10	.....	.....
12th.	26.0	2d.	50.0	16.4	32.0	30th.	4.0	14th.	10	12	8	14	2.49	.....	S.W.
12th.	25.8	2d.	50.7	14.6	32.4	30th.	5.3	1st.	11	9	10	12	2.89	.....	.....
.....	24.2	1st.	49.8	22.1	32.8	21st.	7.9	23d.	9	11	10	11	3.21	.....	N.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3.14	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.13	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.00	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.99	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5.07	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3.05	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.81	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3.85	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.65	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.63	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.95	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3.02	.....	.....
8th.	20.0	.....	66.0	22.7	49.5	11th.	3.0	24th.	11.5	8.8	9.7	10.7	3.45	.115	N.E.

The means for the northern and middle sections are 1.39 inches and .86 inch above the averages for the sections respectively, while the mean for the southern is .22 inch below the average. The mean for the State 3.45 inches is .68 inch above the average for April. The greatest monthly rainfall was 6.30 inches at Bellevue, and the smallest, 1.68 inches, at Wapakoneta. The greatest rainfall reported in any twenty-four hours was 2.45 inches at Bellevue on the 26th and 27th. The highest wind velocities reported during the month were 31 miles W. at Cincinnati; 52 miles W. at Columbus; 47 mile S. W. at Toledo; 60 miles W. at Ohio State University, and 36 miles N. W. at Sandusky on the 9th. Cleveland reported a maximum velocity of 30 miles S. W. on the 12th. The greatest daily movement was 593 miles at Ohio State University on the 9th. Total movement—Cincinnati, 4,851 miles; Columbus, 5,186 miles; Cleveland, 6,120 miles; Toledo, 8,111 miles; O. S. University, 8,310 miles, and Sandusky, 6,816 miles. The percentage of verification of weather signals received from Washington and distributed to thirty-four display stations, was 82 for weather and 88 for temperature. The cold wave signal ordered on the 9th was justified.

METEOROLOGICAL OBSERVATIONS FOR THE MONTH OF MAY, 1890, FURNISHED

Stations.	Ozone. Monthly mean.		Mean barometer.	Highest barometer.	Date.	Lowest barometer.	Date.	Range of barometer.	Mean relative humidity.	Mean temperature.	Highest temperature.
	7 A. M. to 2 P. M.	9 P. M. to 7 A. M.									
Cincinnati.....	.....	.....	29.966	30.341	11th.	29.617	5th.	.724	64.8	63.8	89.9
Dayton.....	2.71	3.41	29.960	30.356	11th.	29.558	5th.	.798	75.2	62.3	87.5
Wapakoneta.....	.....	.....	29.974	30.368	11th.	29.662	5th.	.706	87.8	60.5	90.5
Greenville.....	4.26	4.52	29.945	30.339	11th.	29.583	5th.	.756	84.7	58.8	81.5
Celina.....	.....	.....	29.941	30.353	11th.	29.575	5th.	.778	78.3	60.4	85.5
Upper Sandusky...	6.00	6.61	29.939	30.308	11th.	29.598	5th.	.710	88.0	58.6	85.0
Fostoria.....	.....	.....	.....	.....	.....	.....	.....	.....	77.6	59.1	85.0
Findlay.....	.....	.....	29.953	30.374	11th.	29.570	5th.	.804	77.2	57.7	85.0
Wauseon.....	1.64	2.00	29.940	30.365	11th.	29.568	5th.	.797	75.3	56.1	87.6
Clarksville.....	3.90	4.07	29.978	30.345	11th.	29.626	5th.	.719	78.1	60.0	85.0
Yellow Springs.....	.....	.....	29.946	30.324	11th.	29.599	5th.	.725	76.7	59.6	84.2
North Lewisburg...	.97	3.80	29.995	30.352	11th.	29.678	5th.	.674	77.4	61.9	92.0
Bangorville.....	.....	.....	28.546	28.800	11th.	28.187	5th.	.673	81.6	56.4	84.5
Toledo.....	.....	.....	29.954	30.376	11th.	29.585	5th.	.791	69.3	55.5	86.0
Sandusky.....	.55	1.49	29.939	30.337	11th.	29.565	5th.	.772	71.4	56.0	83.5
Hanging Rock.....	1.23	1.16	29.965	30.280	11th.	29.675	5th.	.605	87.1	60.7	89.0
Portsmouth.....	.....	.....	30.004	30.337	11th.	29.674	5th.	.663	81.7	62.3	89.5
Waverly.....	.....	.....	29.947	30.284	11th.	29.623	5th.	.661	79.9	63.2	89.5
Georgetown.....	.....	.....	29.956	30.298	11th.	29.628	5th.	.670	82.2	62.0	90.0
Columbus.....	.....	.....	29.958	30.316	11th.	29.601	5th.	.715	71.7	60.0	86.0
O. S. University.....	.....	.....	29.940	30.317	11th.	29.587	5th.	.780	78.6	59.3	86.0
Westerville.....	2.97	2.17	29.927	30.344	11th.	29.571	5th.	.733	83.0	58.8	85.0
Logan.....	.....	.....	29.969	30.313	11th.	29.611	5th.	.702	82.7	60.4	91.0
Oberlin.....	.....	.....	29.981	30.333	11th.	29.668	5th.	.670	88.2	56.6	82.0
Marietta.....	.....	.....	29.942	30.291	11th.	29.575	5th.	.716	80.2	61.4	86.5
Pomeroy.....	.....	.....	29.971	30.281	11th.	29.664	5th.	.617	78.4	65.2	92.0
Athens.....	.....	.....	29.940	30.277	11th.	29.566	5th.	.711	78.1	60.2	85.9
Granville.....	.....	.....	29.919	30.257	11th.	29.599	5th.	.665	80.5	59.0	86.0
Newcomerstown.....	.....	.....	29.947	30.300	11th.	29.521	5th.	.779	81.7	57.6	86.0
New Alexandria...	.....	.....	.....	.....	.....	.....	.....	.....	77.9	59.5	84.0
Canton.....	.....	.....	29.947	30.293	11th.	29.567	5th.	.736	.....	57.4	84.5
Youngstown.....	.....	.....	29.940	30.335	11th.	29.599	5th.	.736	86.1	58.7	84.0
Hiram.....	.....	.....	29.950	30.297	11th.	29.580	5th.	.717	77.6	55.3	81.0
Jefferson.....	.....	.....	29.971	30.309	11th.	29.571	5th.	.738	80.2	53.5	78.5
Wooster.....	4.13	3.26	29.957	30.329	11th.	29.599	5th.	.730	79.6	56.0	83.0
Cleveland (S. O.)...	.....	.....	29.958	30.334	11th.	29.587	.....	.747	73.5	55.8	82.0
Cleveland (Hyde)...	.....	.....	.....	.....	.....	.....	.....	.....	.....	56.5	82.5
Akron.....	.13	.32	29.950	30.350	11th.	29.589	5th.	.761	78.9	56.4	82.7
Hudson.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Weymouth.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ellsworth.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ashland.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ottawa.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lordstown.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tiffin.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Kenton.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Waynesville.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Springboro.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Jacksonburg.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Circleville.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
State.....	.....	.....	29.954	30.376	11th.	29.521	5th.	.855	79.1	59.2	92.9

The mean atmospheric pressure, 29.954 inches, was .004 inch below the average for May. The highest barometer, 30.376 inches occurred at Toledo on the 11th. and the lowest, 29.521 inches, at Newcomerstown on the 5th. The mean temperature of the northern section was 56°.6; of the middle section, 59°.3; of the southern section, 61°.8, and of the state, 59°.2. These means are 1°.9, 1°.3, 0°.9 and 1°.4 below the averages for the sections and state for May. The highest temperature reported during the month was 92° at North Lewisburg and Pomeroy on the 30th. The lowest, 28°, at Newcomerstown, on the 2d. The mean daily range of temperature was 21°. The greatest daily range was 44° at Pomeroy on the 17th, and the least 4° at Sandusky on the 4th. On the 2d, 7th, 8th and 11th, heavy frosts occurred in the northern and middle sections, and light frost in the southern. Light frost was reported from all sections on the 1st, 12th and 21st. The mean relative humidity, 79.1 per cent., was 4.9 per cent. above the average. Precipitation was general in all sections on the 1st, 3d, 4th, 5th, 9th, 10th, 13th, 14th, 18th, 19th, 20th, 23d, 24th and 25th; in the northern section on the 21st, 22d and 31st, and in the southern section on the 7th, 16th and 31st. Local rains occurred in all sections on the 6th; in the northern section on the 7th, 11th, 12th, 15th, 16th, 29th and 30th; in the middle section on the 7th, 11th, 12th, 15th, 16th and 31st, and in the southern section on the 11th and 21st.

THE STATE BOARD OF HEALTH BY THE OHIO METEOROLOGICAL BUREAU.

Date.	Lowest temperature.	Date.	Range of temperature.	Mean daily range of temperature.	Greatest daily range of temperature.	Date.	Least daily range of temperature.	Date.	Number of clear days.	Number of fair days.	Number of cloudy days.	Days on which rain fell, with 0.1 rainfall.	Total rainfall for month.	Average daily rainfall.	Direction of wind.
390	8th.	50.0	21.3	33.0	10th.	11.0	13th.	9	9	13	15	3.58	.115	S.W.	
30th.	34.5	8th.	53.0	21.6	36.5	23d.	9.0	6th.	11	11	9	14	3.54	.114	S.
31st.	34.0	8th.	56.5	27.0	43.0	11th.	7.0	4th.	11	9	11	13	5.49	.177	S.W.
29th.	34.0	8th.	47.5	17.5	29.7	12th.	6.8	8th.	8	12	11	14	4.66	.150	S.
29th.	36.0	.....	49.5	19.9	37.0	12th.	9.0	13th	11	11	9	9	5.07	.164	S.W.
31th.	33.0	2d.	52.0	20.2	34.0	2d.	8.0	13th.	8	11	12	17	7.19	.232	S.W.
29th.	30.0	3d.	55.0	23.4	42.5	3d.	6.0	.....	7	11	13	10	4.57	.147	W.
30 h.	31.3	8th.	53.7	20.8	34.4	10th.	9.0	9th.	9	13	9	15	6.40	.206	S.W.
31st.	33.3	8th.	51.7	20.7	35.0	2d.	8.8	21st.	10	10	11	18	5.49	.177	W.
31st.	31.5	8th.	52.7	21.6	32.2	2d.	10.3	6th.	11	5	15	18	4.52	.146	S.W.
30th.	32.0	2d.	60.0	21.4	37.0	2d.	10.0	.....	8	10	13	14	4.65	.150	S.
30th.	30.0	2d.	54.5	21.2	35.0	2d.	11.2	20th	9	7	15	17	7.00	.226	S.W.
30th.	35.0	2d.	51.0	17.2	30.0	2d.	6.0	4th.	8	13	10	16	4.04	.139	S.W.
30th.	34.5	2d.	49.0	16.2	32.0	.....	4.0	4th.	5	11	15	20	5.28	.170	S.W.
.....	35.0	8th.	54.0	25.0	40.0	12th.	9.0	25th.	4	17	10	15	4.93	.159	S.W.
.....	37.0	8th.	52.5	22.0	38.0	12th.	7.0	4th.	9	14	8	13	4.33	.140	S.W.
31st.	37.5	2d.	52.0	22.1	35.5	29th.	8.5	6th.	10	9	12	15	4.92	.154	S.W.
31st.	35.0	8th.	55.0	21.9	37.0	2d.	10.0	19th.	10	9	12	13	3.39	.109	S.
30th.	35.0	2d.	51.0	17.9	32.0	2d.	5.0	20th.	8	11	12	17	5.12	.165	S.
30th.	32.0	2d.	51.0	20.1	34.0	2d.	6.0	7th.	7	10	14	17	4.69	.151	S.
30th.	33.0	2d.	52.0	20.6	36.0	2d.	8.0	20th.	8	10	13	15	5.73	.185	S.
30th.	31.0	8th.	60.0	24.4	40.5	.....	7.0	20th.	10	9	12	13	6.85	.221	S.E.
24th.	33.0	2d.	49.0	19.1	33.0	2d.	8.0	.....	11	11	9	9	5.90	.190	S.W.
30th.	35.0	8th.	51.5	21.2	37.5	2d.	7.9	20th.	8	8	15	17	5.20	.168	S.W.
30th.	33.0	17th.	59.0	24.4	44.0	17th.	9.0	.....	10	11	10	13	4.40	.142	W.
20th.	30.0	8th.	55.9	26.3	43.0	29th.	5.0	20th.	9	9	13	15	5.29	.171	S.W.
30th.	32.2	2d.	53.8	19.5	32.1	2d.	4.8	3d.	1	18	12	10	3.36	.108	S.
30th.	28.0	2d.	58.0	23.2	39.0	2d.	7.0	20th.	7	11	13	16	5.09	.164	W.
.....	32.0	2d.	52.0	20.8	35.0	18th.	8.0	7th.	8	6	17	14	4.63	.149	S.
30th.	29.5	2d.	51.7	21.1	35.7	2d.	8.3	19th.	6	12	13	18	7.99	.258	S.
30th.	29.0	2d.	55.0	21.8	41.0	3d.	9.0	4th.	7	9	15	14	5.44	.175	S.
30th.	31.2	2d.	49.8	19.4	30.3	2d.	7.0	4th.	6	12	13	19	7.43	.240	S.W.
24th.	31.0	2d.	47.5	20.6	33.5	3d.	9.0	6th.	6	14	11	19	6.90	.223	S.
30th.	29.5	2d.	53.5	20.5	35.5	2d.	8.0	20th.	8	12	11	18	6.01	.194	S.
24th.	32.0	2d.	50.9	15.9	33.0	2d.	5.0	6th.	9	11	11	21	6.16	.190	S.E.
24th.	32.3	2d.	50.2	16.9	32.7	2d.	5.2	6th.	7	12	12	21	6.49	.209	S.
30th.	32.0	2d.	50.7	19.0	31.5	2d.	7.2	14th.	5	12	14	21	7.33	.236	S.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	7.68	.248	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6.14	.198	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	8.11	.262	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	7.42	.240	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5.67	.183	.....
.....															
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6.58	.212	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5.27	.170	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.71	.152	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5.60	.181	.....
.....															
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.35	.140	.....
30th.	28.0	2d.	61.0	21.0	44.0	17th.	4.0	4th.	8.0	10.9	12.1	15.5	5.52	.178	S.W.

Light snow was reported on the 6th and 7th at Bangorville and Weymouth, and at Canton on the 8th. Wooster reports an unusually severe hail-storm as occurring on the 18th at Congress, fourteen miles north of Wooster. The mean rainfall in the northern section was 6.58 inches; in the middle section, 5.35 inches, and in the southern section, 4.64 inches. These means are 2.38 inches, 0.88 inch, 0.51 inch above the averages for the sections respectively. The mean for the state, 5.52 inches, is 1.25 inches above the average for May. The greatest monthly rainfall was 8.70 inches at Carrollton, and the smallest, 3.39 inches, at Georgetown. The greatest rainfall reported in any twenty-four consecutive hours was 2.81 inches at Bellevue on the 9th and 10th. The highest wind velocities reported during the month were 42 miles W. at Columbus, and 40 miles N. W. at Toledo on the 15th; 35 miles N. E. at Cleveland on the 10th; 32 miles N. at Sandusky on the 11th, and 46 miles S. W. at Ohio State University on the 24th. The greatest daily movement was 561 miles at Ohio State University on the 10th. Least, 27 miles at Toledo. Total movement—Columbus, 4,110 miles; Cleveland, 5,733 miles; Toledo, 5,135 miles; O. S. University, 5,990 miles, and Sandusky, 5,652 miles. The percentage of verification of weather signals received from Washington and distributed to thirty-four display stations, was 85 for weather and 89 for temperature.

METEOROLOGICAL OBSERVATIONS FOR THE MONTH OF JUNE, 1890, FURNISHED

Stations.	Ozone. Monthly mean.		Mean barometer.	Highest barometer.	Date.	Lowest barometer.	Date.	Range of barometer.	Mean relative humidity.	Mean temperature.	Highest temperature.
	7 A. M. to 2 P. M.	9 P. M. to 7 A. M.									
Cincinnati .....	.....	.....	30.021	30.337	sth.	29.851	12th.	486	65.4	77.8	96.0
Dayton	2.12	2.40	29.967	30.343	sth.	29.815	12th.	528	71.1	77.6	97.0
Wapakoneta .....	.....	.....	30.605	30.293	sth.	29.799	6th.	494	83.4	75.2	101.0
Greenville	4.52	4.23	29.999	30.361	sth.	29.813	12th.	548	81.4	73.5	89.8
Celina .....	.....	.....	30.000	30.366	sth.	29.825	12th.	541	77.9	74.8	92.2
Upper Sandusky	5.77	6.00	29.976	30.352	sth.	29.786	12th.	566	82.6	72.9	93.0
Fostoria .....	.....	.....	29.993	30.360	sth.	29.776	11th.	584	75.0	75.5	97.0
Findlay .....	.....	.....	30.022	30.360	sth.	29.768	11th.	592	70.4	72.5	93.9
Wauseon	1.50	1.60	29.995	30.382	sth.	29.759	6th.	623	71.7	72.8	96.5
Clarksville	2.86	3.28	30.025	30.358	sth.	29.842	21st.	516	78.0	73.6	93.4
Yellow Springs .....	.....	.....	30.003	30.334	sth.	29.810	12th.	524	72.7	73.9	93.9
North Lewisburg	.70	3.93	29.924	30.292	sth.	29.703	6th.	589	72.4	77.5	100.0
Bangorville .....	.....	.....	28.680	28.931	sth.	28.890	12th.	541	78.6	70.1	92.0
Toledo .....	.....	.....	30.002	30.372	sth.	29.775	12th.	597	68.4	72.8	94.0
Sandusky .....	.....	.....	29.992	30.366	sth.	29.750	12th.	616	72.3	72.8	93.0
Hanging Rock	1.23	.59	30.004	30.273	9th.	29.823	12th.	450	89.2	72.8	95.0
Portsmouth .....	.....	.....	30.044	30.334	9th.	29.879	21st.	465	78.6	75.5	98.0
Waverly .....	.....	.....	29.990	30.332	sth.	29.810	12th.	522	78.0	76.7	95.2
Georgetown .....	.....	.....	30.006	30.321	sth.	29.843	12th.	478	78.7	75.9	95.8
Columbus .....	.....	.....	30.005	30.343	sth.	29.799	12th.	544	73.6	74.6	93.0
O. S. University .....	.....	.....	29.955	30.336	sth.	29.787	6th.	579	75.2	73.4	94.0
Westerville	2.38	1.19	29.974	30.328	sth.	29.752	6th.	576	82.0	71.9	92.5
Logan .....	.....	.....	30.024	30.348	sth.	29.818	12th.	530	79.5	73.8	98.5
Oberlin .....	.....	.....	30.002	30.375	sth.	29.816	11th.	559	85.6	70.8	90.0
Marietta .....	.....	.....	30.020	30.364	sth.	29.829	12th.	535	79.8	73.6	90.0
McConnellsville .....	.....	.....	29.996	30.335	sth.	29.793	11th.	542	82.8	74.9	90.8
Pomeroy .....	.....	.....	30.006	30.321	sth.	29.820	21st.	501	76.1	79.4	98.8
Athens .....	.....	.....	30.032	30.369	sth.	29.813	6th.	556	78.2	72.8	91.0
Newcomerstown .....	.....	.....	29.991	30.365	sth.	29.764	12th.	601	82.8	70.1	92.0
New Alexandria .....	.....	.....	.....	.....	.....	.....	.....	.....	80.7	71.8	90.0
Canton .....	.....	.....	29.983	30.354	sth.	29.729	6th.	625	.....	71.6	91.0
Youngstown	1.43	.93	29.962	30.341	sth.	29.754	20th.	587	83.5	71.9	90.0
Hiram .....	.....	.....	29.990	30.368	sth.	29.740	6th.	628	77.6	68.8	87.8
Jefferson .....	.....	.....	30.016	30.373	sth.	29.744	6th.	629	81.9	67.5	89.5
Wooster	3.07	1.55	29.995	30.377	sth.	29.740	6th.	637	80.0	69.8	88.0
Cleveland (S. O.) .....	.....	.....	30.000	30.388	sth.	29.763	12th.	625	78.3	70.4	89.0
Cleveland (Hyde) .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	70.2	89.4
Akron	.60	.13	29.984	30.352	sth.	29.743	6th.	609	78.0	71.2	88.9
Hudson .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Weymouth .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ellsworth .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ashland .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ottawa .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lordstown .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tiffin .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Kenton .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Waynesville .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Springboro .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Jacksonburg .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Circleville .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
State .....	.....	.....	29.997	30.388	8th.	29.703	6th.	685	77.6	73.3	101.0

The mean atmospheric pressure, 29.997 inches, was .006 inch below the average for June. The highest barometer, 30.388 inches, occurred at Cleveland (S. O.), on the 8th, and the lowest, 29.703 inches, at North Lewisburg, on the 6th. The month was characterized by unusually warm weather and excessive rain. The mean temperature, 73° 3, is 3° 8 above the average, and is the highest mean temperature on record for June since the opening of the Bureau. The mean for the northern section was 71° 4; for the middle section, 78° 3; and for the southern section, 75° 3. These means are 3° 3, 4° 0 and 4° 2 above the averages for the sections. The maximum temperature, 101°, occurred at Wapakoneta on the 28th, and the minimum temperature, 38° 8, at Wauseon on the 8th. The highest temperature on record in the Bureau for June 102° on June 20th, 1887, and June 18th and 20th, 1888. The mean daily range of temperature was 21° 5. The greatest daily range was 42° at Logan on the 3d, and the smallest 7° at Sandusky on the 27th. The mean relative humidity, 77.6 per cent, was 1.3 per cent. above the average. The rainfall was well distributed throughout the month, and was the largest on record in this bureau for June. The mean in the northern section was 4.03 inches; for the middle section 4.74 inches, and for the southern section 4.74 inches. These means are 0.33 inch, 0.95 inch and 0.69 inch above the averages of the sections for June. The mean for the State, 4.50

THE STATE BOARD OF HEALTH BY THE OHIO METEOROLOGICAL BUREAU.

Date.	Lowest temperature.	Date.	Range of temperature.	Mean daily range of temperature.	Greatest daily range of temperature.	Date.	Least daily range of temperature.	Date.	Number of clear days.	Number of fair days.	Number of cloudy days.	Days on which rain fell, with 0.1 rain fall.	Total rainfall for month.	Average daily rainfall.	Direction of wind.
28th.	54.0	8th.	42.0	18.9	21.0	11th.	13.0	5th.	6	15	6	14	6.00	.200	W.
28th.	50.0	8th.	47.0	21.8	32.5	26th.	15.0	5th.	12	15	3	8	3.28	.109	W.
28th.	45.0	8th.	56.0	25.5	37.0	2d.	15.0	12th.	19	9	3	3	1.4	.05	S.
28th.	46.5	8th.	43.3	16.7	26.5	8th.	9.5	5th.	12	15	12	4.66	.155	S.	
29th.	45.5	8th.	46.7	17.2	30.5	8th.	10.0	5th.	15	12	5	5	3.60	.120	W.
28th.	52.0	.....	41.0	21.2	31.0	2d.	14.0	18th.	11	12	13	5.94	.198	W.	
29th.	48.0	8th.	49.0	23.8	36.0	2d.	14.0	16th.	11	15	4	5	5.34	.178	W.
28th.	45.0	7th.	48.9	22.9	34.5	2d.	14.0	5th.	16	12	7	3.80	.127	W.	
29th.	38.8	8th.	57.7	25.3	39.7	8th.	14.6	5th.	10	13	9	3.88	.129	W.	
28th.	51.4	8th.	42.0	20.7	30.6	27th.	13.4	6th.	13	12	5	13	4.83	.161	W.
28th.	51.5	2d.	42.4	20.8	33.4	3d.	11.8	7th.	10	13	8	3.6	.109	S.	
29th.	49.0	9th.	51.0	23.6	34.0	2d.	15.0	25th.	14	11	5	7	1.85	.162	W.
28th.	46.3	8th.	46.7	23.0	31.0	28th.	14.0	12th.	12	14	4	13	5.12	.171	S.
28th.	46.0	8th.	48.0	18.9	27.0	1st.	13.0	11th.	7	18	5	9	2.49	.082	S.
28th.	54.0	8th.	39.0	16.5	28.0	28th.	7.0	27th.	3	19	8	16	2.78	.093	E.
28th.	52.0	8th.	43.0	20.6	35.0	28th.	15.0	25th.	10	18	2	12	5.42	.181	W.
21st.	53.5	8th.	44.5	24.6	30.5	.....	.....	.....	14	15	1	15	4.23	.144	W.
28th.	53.0	8th.	42.2	21.3	30.2	2th.	16.0	18th.	11	14	5	14	5.93	.198	W.
27th.	53.0	8th.	42.8	23.7	31.0	2d.	17.0	12th.	11	6	13	15	6.38	.213	S.
29th.	53.0	8th.	40.0	19.8	27.0	2d.	15.0	18th.	10	16	4	15	4.95	.165	S.
29th.	48.0	8th.	46.0	21.6	30.0	.....	14.0	12th.	12	16	2	16	5.43	.181	S.
29th.	48.0	8th.	44.5	23.0	32.5	2d.	15.0	12th.	15	10	5	12	3.45	.115	S.
28th.	49.0	8th.	49.5	26.8	42.0	3d.	18.0	.....	11	14	5	12	3.74	.125	E.
28th.	47.0	8th.	43.0	18.9	28.0	.....	12.0	12th.	15	15	.....	7	3.26	.109	W.
.....	51.6	8th.	48.4	21.1	33.0	2d.	14.7	7th.	7	17	6	15	5.31	.180	N.
29th.	48.4	8th.	42.4	22.6	35.9	2d.	15.0	10th.	8	14	8	14	8.03	.274	W.
25th.	51.0	8th.	47.8	26.6	36.0	3d.	15.0	7th.	14	13	3	8	2.03	.068	W.
22d.	48.3	8th.	42.7	23.4	33.0	21.	16.7	12th.	5	20	5	9	2.91	.097	S.
30th.	44.0	8th.	48.0	25.2	35.5	2d.	13.0	12th.	12	13	5	14	8.72	.291	W.
24th.	45.0	8th.	45.0	21.1	30.0	.....	9.0	6th.	11	15	4	8	3.67	.122	N.
24th.	46.2	8th.	44.8	22.8	33.8	19th.	10.5	12th.	12	16	2	15	2.76	.092	S.
24th.	48.0	8th.	42.0	21.1	33.0	4th.	9.0	12th.	15	9	6	6	2.83	.094	S.
30th.	44.5	8th.	43.3	20.0	27.0	22d.	8.4	12th.	14	16	.....	10	4.41	.147	W.
24th.	42.5	8th.	47.0	21.4	32.5	2d.	11.7	21st.	12	13	5	10	3.29	.110	S.
.....	46.0	8th.	42.0	21.5	32.0	2d.	11.0	.....	11	14	5	13	5.57	.186	S.
.....	49.0	8th.	40.0	16.3	27.0	3d.	8.0	29th.	8	15	7	10	4.50	.150	S.
.....	49.0	8th.	40.4	17.4	26.9	3d.	9.1	.....	6	18	6	9	5.22	.174	S.
30th.	47.9	8th.	43.0	19.3	28.9	28th.	7.1	12th.	10	15	5	12	4.02	.134	S.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	8	2.89	.096	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	8	3.85	.128	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	12	6.00	.200	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	8	3.93	.131	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	7	2.87	.096	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	12	6.96	.232	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	10	6.84	.228	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	13	4.50	.150	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	8	3.92	.131	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	8	5.66	.187	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	12	5.62	.167	.....
28th.	38.8	8th.	62.2	21.5	42.0	3d.	7.0	27th.	11.2	14.2	4.6	10.4	4.50	.150	S. W.

inches, is .65 inch in excess of the usual amount. The greatest monthly rainfall, 8.72 inches, at Newcomerstown, is the highest June record. Bucyrus reported a rainfall of 3.15 inches in four hours on the 21st, and Upper Sandusky one of 2.75 inches in three hours on the same day. Forty stations reported rainfall of one inch or more in twenty-four consecutive hours. Hail occurred in the northern section on the 1st, 5th, 11th, 22d and 29th; in the middle section on the 3d, 15th and 28th, and in the southern section on the 5th and 28th. The highest wind velocities reported during the month were 37 miles N. W. at Cincinnati on the 11th; 52 miles S.W. at Columbus on the 30th; 35 miles N.E. at Cleveland on the 17th; 36 miles N. at Toledo on the 30th; 42 miles S.W. at Ohio State University on the 11th, and 34 miles N. E. at Sandusky on the 28th. The greatest daily movement was 881 miles at Ohio State University on the 7th, and the least, 55 miles at Toledo on the 8th. Total movement—Cincinnati, 4,479 miles; Columbus, 3,531 miles; Cleveland, 4,336 miles; Toledo, 4,046 miles; O. S. University, 51,550 miles (27 days); Sandusky, 4,435 miles. The percentage of verification of weather signals received from Washington and distributed to thirty-two display stations, computed from the reports of observers, was 80 for weather and 87 for temperature.

METEOROLOGICAL OBSERVATIONS FOR THE MONTH OF JULY, 1890, FURNISHED

Stations.	Ozone. Monthly mean.		Mean barometer.	Highest barometer.	Date.	Lowest barometer.	Date.	Range of barometer.	Mean relative hu- midity.	Mean temperature.	Highest temperature.
	7 A. M. to 2 P. M.	9 P. M. to 7 A. M.									
Cincinnati			30.035	30.257	21st.	29.741	1st.	.516	61.6	77.0	95.0
Dayton	1.12	1.14	30.009	30.249	2 nd .	29.705	2d.	.544	63.6	77.9	99.0
Greenville			30.009	30.250	21st.	29.740	2d.	.510	75.5	73.6	91.0
Celina			29.972	30.268	21st.	29.719	2d.	.549	72.6	74.9	98.5
Upper Sandusky	6.19	6.07	29.984	30.262	21st.	29.681	2d.	.581	76.9	72.4	96.0
Fostoria			30.016	30.322	21st.	29.706	2d.	.616	75.6	75.1	98.0
Wauseon	1.71	1.35	30.019	30.348	21st.	29.727	2d.	.621	64.6	72.7	97.7
Clarksville	2.64	2.87	30.033	30.269	21st.	29.729	2d.	.540	68.6	74.4	94.3
North Lewisburg	4.32	6.45	30.031	30.313	21st.	29.739	2d.	.574	67.5	77.4	101.0
Bangorville											
Toledo			30.030	30.335	21st.	29.733	2d.	.602	61.4	72.3	95.0
Sandusky	1.52	2.35	30.018	30.304	21st.	29.717	2d.	.587	63.3	73.1	98.2
Hanging Rock	1.87	0.04	30.005	30.291	21st.	29.734	2d.	.557	86.2	71.3	96.0
Portsmouth			30.030	30.253	20th.	29.767	2d.	.486	77.2	75.1	98.5
Waverly			30.040	30.230	21st.	29.707	2d.	.523	75.0	76.0	96.5
Georgetown			30.008	30.231	21st.	29.719	2d.	.512	75.1	75.8	97.8
Columbus			30.020	30.258	21st.	29.709	1st.	.549	65.0	73.6	96.0
O. S. University			30.005	30.247	20th.	29.683	2d.	.564	71.9	72.9	95.0
Westerville	2.23	1.60	30.019	30.250	21st.	29.690	2d.	.560	80.0	70.7	95.0
Logan			30.011	30.243	21st.	29.723	2d.	.520	77.2	72.4	99.0
Oberlin			30.026	30.329	21st.	29.715	1st.	.614	75.6	70.4	93.0
Marion			30.039	30.252	21st.	29.705	2d.	.547	75.9	73.2	92.0
McConnelsville			30.002	30.241	21st.	29.722	2d.	.519	79.8	73.4	92.3
Granville				30.214	21st.	29.683	2d.	.571			92.7
Newcomerstown			30.017	30.279	21st.	29.660	2d.	.619	81.1	70.1	94.0
New Alexandria									77.2	72.0	92.0
Canton			30.068	30.289	21st.	29.638	2d.	.651		71.7	95.2
Youngstown	1.20	0.84	29.999	30.316	21st.	29.671	2d.	.645	81.8	71.4	93.5
Hiram			30.018	30.307	21st.	29.706	2d.	.601	70.7	69.2	91.0
Jefferson			30.053	30.347	21st.	29.714	2d.	.633	75.7	68.0	84.0
Wooster	3.36	1.97	30.026	30.319	21st.	29.676	2d.	.643	73.6	70.5	94.0
Cleveland (S. O.)			30.020	30.320	21st.	29.710	1st.	.610	68.0	71.6	97.0
Cleveland (Hyde)										71.0	94.7
Akron	0.90	0.09	30.003	30.294	21st.	29.657	2d.	.637	74.4	71.4	92.9
Hudson											
Weymouth											
Ellsworth											
Ashland											
Ottawa											
Lordstown											
Tiffin											
Kenton											
Waynesville											
Springboro											
Jacksonburg											
Circleville											
State			30.016	30.348	21st.	29.638	2d.	.710	73.2	73.0	101.0

The mean atmospheric pressure, 30.016 inches was 0.39 inch above the average for July. The highest barometer, 30.348 inches, occurred at Wauseon on the 21st, is the highest July record. The lowest, 29.638 in. was occurred at Canton on the 2d. The mean temperature for the northern section was 71° 5'; for the middle section, 78° 2'; and for the southern section, 74° 6'. These means are 0° 3, 0° 2 and 0° 1 below the averages for the sections for July. The mean for the State, 73° 0 is 0° 2 below the average. The maximum temperature, 101°, occurred at North Lewisburg on the 31st, and the minimum, 42° 8, at Wauseon and Newcomerstown on the 21st. The mean daily range of temperature was 22° 9. The greatest daily range was 41° at Oberlin on the 7th, and at Logan on the 12th, and the least, 4°, at Cleveland (S. O.) on the 9th. Light frost occurred at Garrettsville, Orangeville, Lordstown, Marion and Wauseon on the 21st. Youngstown reports a heavy frost on the same date, a few miles north of that place, with considerable damage to corn and potatoes. The mean relative humidity, 73.2 per cent., was normal. Precipitation was general in all sections on the 1st, 13th and 24th; in the northern section on the 2d, 4th and 17th, and in the middle and southern sections on the 23d. Local rains fell in the northern section on the 3d, 12th, 23d, 25th, 29th and 31st, and in the middle section on the 2d, 8th, 9th, 15th 17th, 25th and 31st, and in the southern section on the 2d, 4th, 15th and 17th. The mean rainfall in the northern section was 2.08 inches; for the middle section 1.96 inches, and for the southern section 1.92 inches. These means are 1.12 inches, 1.53

THE STATE BOARD OF HEALTH BY THE OHIO METEOROLOGICAL BUREAU.

Date.	Lowest temperature.	Date.	Range of temperature.	Mean daily range of temperature.	Greatest daily range of temperature.	Date.	Least daily range of temperature.	Date.	Number of clear days.	Number of fair days.	Number of cloudy days.	Days on which rain fell, with 0.1 rainfall.	Total rainfall for month.	Average daily rainfall.	Direction of wind.
8th.	58.0	10th.	37.0	20.3	31.0	22d.	9.0	23d.	15	13	3	5	1.46	.047	S. W.
8th.	50.5	22d.	45.5	26.0	38.0	12th.	11.0	13th.	24	5	2	2	0.23	.009	S. W.
.....	49.0	22d.	42.0	20.7	32.2	12th.	10.0	13th.	19	10	2	2	0.07	.002	S.
.....	50.0	22d.	43.5	20.6	32.7	22d.	12.0	13th.	12	17	2	1	0.40	.013	S. W.
8th.	48.0	.....	45.0	23.4	37.0	11th.	13.0	13th.	18	10	3	5	2.41	.079	N.E.
8th.	46.0	21st.	51.0	25.8	38.0	22d.	16.0	.....	8	19	4	3	0.90	.029	S.
31st.	42.5	21st.	55.2	29.4	40.9	11th.	17.2	13th.	15	14	2	7	0.48	.032	S. W.
8th.	53.0	22d.	41.3	23.8	36.1	6th.	6.4	23d.	24	5	2	6	1.43	.046	E.
31st.	49.0	21st.	52.0	26.2	39.0	.....	13.0	9th.	23	5	3	3	0.30	.010	W.
8th.	47.5	21st.	45.1	21.3	33.5	11th.	14.8	23d.	19	8	4	6	2.01	.065	S. W.
31st.	50.0	10th.	45.0	19.5	29.0	12th.	7.0	4th.	13	16	2	6	0.86	.028	S. W.
8th.	56.0	.....	42.2	18.2	30.0	17th.	5.0	9th.	6	23	2	7	1.99	.064	S. W.
8th.	59.0	.....	46.0	24.9	36.0	12th.	8.0	23d.	15	12	4	5	4.38	.141	E.
7th.	53.0	11th.	45.5	23.9	40.0	12th.	4.5	23d.	22	6	3	5	2.98	.096	S. W.
8th.	53.0	20th.	43.5	22.2	35.7	12th.	7.5	23d.	19	8	4	5	3.00	.097	S. W.
8th.	51.0	.....	43.8	24.5	36.9	12th.	11.5	23d.	19	6	6	5	2.18	.070	S.
8th.	50.0	21st.	46.0	20.5	30.0	7th.	8.0	13th.	24	4	3	7	1.80	.058	S.
.....	45.0	21st.	50.0	23.8	37.0	12th.	10.0	13th.	24	5	2	6	1.37	.044	S.
8th.	44.5	21st.	50.5	26.8	37.5	12th.	10.0	13th.	24	4	3	4	2.99	.096	E.
8th.	44.5	21st.	54.5	27.2	41.0	12th.	8.0	13th.	19	9	3	6	1.80	.058	E.
8th.	45.0	.....	47.0	20.2	41.0	7th.	6.0	.....	20	11	.....	6	4.32	.139	S. W.
8th.	51.1	10th.	40.9	21.2	31.5	22d.	7.7	23d.	14	12	5	7	3.16	.102	N.
.....	46.8	21st.	45.5	23.4	33.8	12th.	5.3	23d.	18	7	6	6	2.61	.084	N.
31st.	47.9	21st.	44.8	23.3	36.5	7th.	10.2	3d.	20	7	4	7	2.03	.065	S. W.
8th.	42.5	21st.	51.5	26.2	38.9	22d.	10.0	24th.	19	9	3	5	5.24	.169	W.
.....	47.0	10th.	45.0	21.7	33.0	11th.	7.0	24th.	19	8	4	8	3.22	.104	S.
8th.	46.0	21st.	49.2	24.1	38.0	12th.	11.2	24th.	19	10	2	8	2.15	.069	S.
31st.	43.2	21st.	50.3	22.5	38.0	7th.	7.5	24th.	17	11	3	6	2.59	.081	S.
31st.	47.0	.....	44.0	21.5	31.4	11th.	11.7	26th.	19	11	1	8	1.68	.051	S. W.
.....	41.0	21st.	50.0	22.7	35.2	17th.	11.5	24th.	21	10	.....	6	2.87	.076	S.
31st.	45.0	21st.	49.0	23.2	31.0	22d.	9.5	24th.	20	9	2	6	2.67	.086	S.
8th.	50.0	21st.	47.0	17.7	29.9	17th.	4.0	9th.	15	14	2	7	2.77	.089	S. E.
31st.	48.3	21st.	45.4	19.0	29.4	17th.	8.3	3d.	16	11	4	9	3.29	.106	S.
31st.	45.0	21st.	47.9	21.9	31.0	22d.	10.3	3d.	11	17	3	7	2.16	.070	S. W.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.06	.066	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.03	.065	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.95	.063	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.45	.047	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.76	.024	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.66	.054	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.90	.029	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.03	.035	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.48	.016	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.33	.043	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.30	.010	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.46	.047	.....
31st.	25	21st.	58.5	22.9	41.0	.....	40	9th.	17.8	10.3	2.9	5.6	1.99	.064	S. W.

inches and 1.49 inches below the averages of the sections for July. The mean for the State, 1.99 inches, is 1.33 inches below the average. The following unusually heavy rainfalls occurred on the 1st: 1.41 inches in forty minutes at Wooster; 1.49 inches in twenty-five minutes at Gratiot; and 3.29 inches in ninety minutes at Newcomerstown. Newcomerstown also reports a fall of .94 inch in less than fifteen minutes, on the 24th, accompanied by large hail. Twenty-two stations reported precipitation of one inch in twenty-four consecutive hours. The greatest monthly rainfall, 5.24 inches, at Newcomerstown, and the least, .07 inch, at Greenville. The highest wind velocities reported during the month were 23 miles S. W. at Cincinnati on the 1st; 35 miles W. at Columbus on the 9th; 29 miles W. at Cleveland on the 8th; 38 miles S. W. at Toledo on the 31st; 41 miles W. at Ohio State University and 30 miles W. at Sandusky on the 8th. The greatest daily movement was 394 miles at Toledo on the 3d, and the least, 60 miles at Columbus on the 11th. Total movement—Cincinnati, 4,656 miles; Columbus, 3,857 miles; Cleveland, 5,355 miles; Toledo, 5,171 miles; O. S. University, 4,928 miles; and Sandusky, 5,745 miles. The percentage of verification of weather signals received from Washington and distributed to nineteen display stations, computed from the reports of observers, was 82 for weather and 88 for temperature.

METEOROLOGICAL OBSERVATIONS FOR THE MONTH OF AUGUST, 1890, FURNISHED

Stations.	Ozone. Monthly mean.		Mean barometer.	Highest barometer.	Date.	Lowest barometer.	Date.	Range of barometer.	Mean relative humidity.	Mean temperature.	Highest temperature.
	7 A. M. to 2 P. M.	9 P. M. to 7 A. M.									
Cincinnati.....			30.086	30.333	23d.	29.754	26th.	.579	71.6	72.6	94.0
Dayton.....	1.78	1.90	30.058	30.325	23d.	29.707	26th.	.618	71.8	72.3	98.0
Wapakoneta.....			30.038	30.253	23d.	29.846	9th.	.407	77.3	71.2	100.0
Greenville.....			30.39	30.265	23d.	29.700	26th.	.565	81.5	68.6	92.0
Celina.....			30.054	30.324	23d.	29.757	26th.	.547	77.8	70.1	95.5
Upper Sandusky.....	5.74	6.39	30.029	30.321	23d.	29.763	26th.	.558	81.2	68.2	96.0
Fostoria.....			30.055	30.324	23d.	29.773	26th.	.551	75.9	69.9	98.0
Findlay.....			30.051	30.297	23d.	29.739	26th.	.558	76.3	67.5	96.7
Wauseon.....	1.65	1.26	30.068	30.352	23d.	29.776	21st.	.576	69.2	67.6	100.0
Clarksville.....	2.59	2.46	30.078	30.330	23d.	29.760	26th.	.570	75.0	69.6	97.6
North Lewisburg.....	.93	3.5	30.050	30.343	23d.	29.681	26th.	.62	71.1	72.6	103.1
Bangorville.....			28.673	28.851	22d.	28.330	26th.	.521	76.8	66.3	92.7
Toledo.....			30.075	30.359	23d.	29.778	26th.	.581	68.4	67.8	96.0
Sandusky.....	1.07	1.64	30.060	30.290	23d.	29.712	26th.	.578	69.0	68.6	96.0
Hanging Rock.....	1.42	.26	30.056	30.279	23d.	29.787	26th.	.492	90.3	68.5	95.0
Portsmouth.....			30.080	30.294	23d.	29.749	26th.	.545	84.5	70.6	95.0
Waverly.....			30.052	30.295	23d.	29.734	26th.	.561	81.5	71.5	95.0
Georgetown.....			30.057	30.305	23d.	29.719	26th.	.586	82.6	70.6	97.2
Columbus.....			30.060	30.305	23d.	29.707	26th.	.598	70.4	70.2	94.0
O. S. University.....			30.045	30.276	24th.	29.714	26th.	.562	77.3	68.5	94.5
Westerville.....	2.16	1.28									
Logan.....			30.056	30.270	23d.	29.723	26th.	.547	80.9	68.7	99.5
Oberlin.....			30.063	30.297	24th.	29.750	26th.	.547	79.5	65.7	93.0
Marietta.....			30.076	30.281	24th.	29.723	26th.	.558	81.5	69.8	92.5
McDonnellsville.....			30.053	30.265	24th.	29.715	26th.	.547	83.5	69.0	95.0
Pomeroy.....			30.090	30.315	23d.	29.816	26th.	.499	82.1	71.4	99.0
Athens.....			30.094	30.316	23d.	29.735	26th.	.581	81.2	68.5	95.3
Granville.....			30.051	30.286	23d.	29.703	26th.	.583	76.4	67.7	93.9
Newcomerstown.....			30.049	30.274	24th.	29.678	26th.	.596	84.4	66.3	94.5
New Alexandria.....									78.5	68.4	93.0
Canton.....			30.043	30.288	24th.	29.693	26th.	.595		67.5	95.2
Youngstown.....	1.10	1.22	30.024	30.297	23d.	29.651	26th.	.646	85.1	67.6	94.3
Hiram.....			30.048	30.256	23d.	29.730	26th.	.526	77.8	65.3	91.5
Jefferson.....			30.068	30.276	31st.	2.713	26th.	.568	80.0	64.6	94.5
Wooster.....	3.32	1.76	30.056	30.348	24th.	29.702	26th.	.616	80.0	65.8	94.5
Cleveland (S. O.).....			30.058	30.277	24th.	29.720	26th.	.557	71.4	67.8	96.0
Cleveland (Hyde).....										67.0	91.5
Akron.....	.36	.13	30.038	30.270	23d.	29.696	26th.	.574	78.3	66.8	95.3
Hudson.....											
Weymouth.....											
Elsworth.....											
Ashland.....											
Ottawa.....											
Tiffin.....											
Kenton.....											
Waynesville.....											
Springboro.....											
Jacksonburg.....											
Circleville.....											
State.....			30.058	30.359	23d.	29.651	26th.	.708	78.0	66.8	103.1

The mean atmospheric pressure, 30.058 inches, was .032 inch above the average for August. The highest barometer, 30.359 inches, occurred at Toledo on the 23d, and the lowest, 29.651 inches, at Youngstown on the 26th. The mean temperature for the northern section was 67° 2; for the middle section 69°; and for the southern section, 70° 3. These means are 0° 9, 0° 8 and 1° 1 below the averages for the sections for July. The mean for the State, 68° 8, was 0° 9 below the average, and is the lowest August mean since 1883. The maximum temperature was 103° 1 at North Lewisburg on the 3d. This maximum has been exceeded but twice since the opening of the Bureau in 1883. The highest August record is 104° on the 4th and 10th at Pomeroy in 1887. The minimum temperature during the past month was 33° 5 at Wooster on the 24th. The mean daily range of temperature was 20° 4. The greatest daily range was 44° 1 at Wauseon on the 12th, and the least, 4° at Hanging Rock on the 14th. Light frost occurred at Wapakoneta on the 22d; at Wauseon, Tiffin, Leipsic, Kenton and Bueryus on the 23d; at Newcomerstown, Vienna and Weymouth on the 24th, and at Weymouth, Vienna, Orangeville and Lordstown on the 31st. The mean relative humidity, 78 per cent, was 2.4 per cent. above the average. Precipitation was general in all sections on the 4th, 5th, 17th, 19th, 21st, 25th and 26th; in the northern section on the 1st, 22d and 27th; in the middle section on the 20th, and in the southern section on the 7th, 14th, 18th, 20th and 22d. Local rains fell in the northern section and middle sections on the 18th, 29th and 30th; in the middle section on the 9th

THE STATE BOARD OF HEALTH BY THE OHIO METEOROLOGICAL BUREAU.

Date.	Lowest temperature.	Date.	Range of temperature.	Mean daily range of temperature.	Greatest daily range of temperature.	Date.	Least daily range of temperature.	Date.	Number of clear days.	Number of fair days.	Number of cloudy days.	Days on which rain fell, with 0.1 rainfall.	Total rainfall for month.	Average daily rainfall.	Direction of wind.
4th.	51.0	23d.	43.0	17.7	26.0	8th.	6.0	7th.	4	17	16	15	5.91	.191	S. W.
3d.	46.0	23d.	52.0	21.4	32.5	15th.	13.0	.....	13	12	6	9	5.27	.176	S. W.
3d.	40.0	27th.	60.0	25.1	39.0	6th.	10.0	31st.	20	8	3	3	4.46	.144	S. W.
4th.	45.0	23d.	47.0	17.4	28.5	6th.	7.5	21st.	14	11	6	9	4.60	.148	S. W.
3d.	46.0	23d.	49.5	18.4	29.0	12th.	8.5	21st.	11	16	4	6	4.25	.137	S. W.
3d.	43.0	24th.	53.0	21.3	35.0	.....	10.0	26th.	12	14	5	6	4.15	.134	S. E.
3d.	41.0	.....	54.0	23.5	36.0	.....	9.0	21st.	8	21	2	4	3.20	.103	W.
3d.	41.0	24th.	55.7	23.1	35.3	12th.	11.8	21st.	14	12	5	6	2.70	.087	S. W.
3d.	40.6	23d.	59.4	27.7	44.1	12th.	0.8	21st.	13	12	6	7	3.48	.112	S. W.
3d.	55.2	23d.	52.4	22.7	34.9	12th.	11.8	19th.	12	11	8	11	4.36	.141	W.
3d.	45.0	31st.	58.1	24.0	37.0	.....	0.0	21st.	15	8	8	8	3.05	.098	N.
3d.	43.5	23d.	49.2	20.4	28.5	16th.	11.0	.....	12	14	5	6	3.52	.115	S. W.
3d.	45.0	23d.	51.0	18.0	28.0	16th.	8.0	.....	12	10	9	7	4.43	.143	S. W.
3d.	48.0	24th.	48.0	15.5	27.0	8th.	7.0	.....	4	18	0	14	8.17	.102	S. E.
3d.	43.0	24th.	50.0	20.7	31.0	4th.	4.0	14th.	7	16	8	11	7.44	.240	W.
1st.	45.5	.....	46.0	20.4	36.5	25th.	8.0	.....	11	8	12	16	6.36	.205	S. W.
.....	40.0	31st.	45.0	18.3	27.5	16th.	8.0	14th.	12	10	9	14	5.66	.183	S. W.
3d.	49.0	23d.	48.2	19.9	0.0	12th.	6.0	14th.	9	7	15	15	8.39	.271	S.
2d.	48.0	.....	46.0	18.0	26.0	16th.	9.0	26th.	12	9	10	8	2.75	.089	S.
2d.	43.0	31st.	51.5	22.1	35.0	16th.	9.0	21st.	13	12	5	12	3.71	.120	S.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3.76	.121	.....
3d.	44.0	.....	55.5	24.8	39.0	.....	11.0	21st.	10	11	10	10	7.62	.246	S. E.
3d.	43.0	18th.	50.0	18.2	30.0	.....	11.0	.....	13	13	5	6	2.88	.093	N.
4th.	45.7	24th.	46.8	18.9	31.0	12th.	8.0	14th.	9	10	12	12	5.24	.169	N.
3d.	43.5	21th.	51.5	20.8	32.9	16th.	9.6	14th.	7	13	11	1	7.95	.256	S.
2d.	42.0	.....	57.0	21.9	32.0	.....	8.0	5th.	10	12	9	7	6.26	.205	W.
3d.	43.0	24th.	52.3	21.9	34.8	12th.	10.2	20th.	6	11	14	11	5.60	.181	S. W.
3d.	41.4	23d.	49.5	20.4	31.3	16th.	9.8	21st.	11	13	7	11	4.48	.145	N.
.....	40.0	24th.	54.5	24.7	40.0	16th.	11.0	5th.	12	13	6	6	5.76	.186	W.
.....	44.0	24th.	51.0	18.1	30.0	16th.	8.0	21st.	11	9	11	11	5.48	.177	N.
3d.	42.5	31st.	52.7	21.1	36.3	16th.	12.0	21st.	13	13	5	10	6.16	.199	S. W.
3d.	40.0	24th.	54.3	21.5	37.5	16th.	8.1	2 st.	7	15	9	9	4.29	.138	S.
3d.	41.0	.....	47.5	18.7	31.6	16th.	10.7	2 st.	12	14	5	9	3.69	.119	S. W.
3d.	43.5	31st.	50.0	19.3	34.0	16th.	8.0	22d.	8	16	7	8	6.28	.203	S. W.
3d.	34.5	24th.	53.0	21.8	37.0	16th.	9.0	21st.	13	14	4	10	4.66	.150	S.
3d.	4.0	31st.	50.0	13.7	30.0	16th.	6.0	30th.	7	14	10	12	3.14	.101	N. W.
3d.	45.2	31st.	47.3	15.8	30.6	16th.	8.0	28th.	11	10	10	12	2.72	.088	S.
3d.	42.9	24th.	52.4	19.1	33.5	16th.	9.5	21st.	11	11	9	12	4.83	.156	N.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.93	.062	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5.52	.178	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3.88	.125	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5.44	.175	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.19	.071	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.32	.075	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3.87	.125	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.07	.131	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.11	.133	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3.35	.108	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	7.41	.239	.....
3d	39.5	21th.	63.6	20.4	44.1	12th.	4.0	14th.	10.8	12.4	7.8	9.6	4.66	.151	S. W.

and 7th, and in the southern section on the 9th, 13th, 27th and 29th. The precipitation was largely in excess of the usual amount in all sections. Fifty-two stations, out of a total of sixty-two, report rainfalls of one inch or more and ten stations rainfalls of over two and one-half inches in twenty-four consecutive hours. The mean rainfall in the northern section was 3.90 inches; for the middle section 4.34 inches, and for the southern section 5.85 inches. These means are 1.04 inches, 0.88 inch and 2.05 inches above the averages for the sections. The mean for the State, 4.70 inches, is 1.33 inches above the average for August. The greatest monthly rainfall, 8.39 inches, at Georgetown, and the least, 1.93, at Hudson. The highest wind velocities reported during the month were 35 miles N. W. at Cincinnati on the 1st; 35 miles S. W. at Toledo on the 3d; 28 miles W. at Columbus, and 49 miles W. at Ohio State University on the 7th, and 27 miles S. at Cleveland, and 40 miles W. at Sandusky on the 21st. The greatest daily movement was 333 miles at Sandusky date not given, and the least, 55 miles at Cincinnati on the 28th. Total movement—Cincinnati, 4,416 miles; Columbus, 3,447 miles; Cleveland, 5,084 miles; Toledo, 4,901 miles; Ohio State University, 5,496 miles; and Sandusky, 5,783 miles. The percentage of verification of weather signals received from Washington and distributed to twenty display stations, computed from the reports of observers, was 84 for weather and 88 for temperature.

METEOROLOGICAL OBSERVATIONS FOR THE MONTH OF SEPTEMBER, 1890, FURNISHED

Stations.	Ozone Monthly mean.		Mean barometer.	Highest barometer.	Date.	Lowest barometer.	Date.	Range of barometer.	Mean relative humidity.	Mean temperature.	Highest temperature.
	7 A. M. to 2 P. M.	9 P. M. to 7 A. M.									
Cincinnati.....			30.130	30.342	.....	29.967	.....	.435	77.8	65.8	89.0
Dayton.....	0.93	1.93	30.111	30.369	28th.	29.889	12th.	.480	82.1	63.4	87.5
Wapakoneta.....			30.109	30.361	28th.	29.892	12th.	.469	86.4	60.7	88.0
Greenville.....			30.091	30.344	28th.	29.876	12th.	.468	89.7	60.4	83.5
Celina.....			30.124	30.418	28th.	29.892	12th.	.526	90.3	61.8	84.0
Upper Sandusky...	4.43	4.13	30.099	30.368	28th.	29.861	12th.	.507	87.5	60.9	83.0
Findlay.....			30.157	30.427	28th.	29.862	12th.	.565	86.3	59.5	88.0
Wauseon.....	1.73	1.50	30.134	30.455	28th.	29.843	19th.	.612	77.9	58.8	88.3
Clarksville.....	2.17	2.24	30.123	30.338	28th.	29.931	12th.	.427	82.0	62.5	87.0
North Lewisburg.			30.124	30.386	28th.	29.921	13th.	.465	80.2	63.9	91.0
Bangorville.....			28.815	28.916	28th.	28.477	13th.	.439	81.9	59.8	85.5
Toledo.....			30.146	30.449	28th.	29.845	19th.	.604	76.0	59.0	87.0
Sandusky.....	0.77	1.10	30.130	30.339	28th.	29.854	19th.	.545	75.2	61.5	92.0
Hanging Rock.....	0.70	0.13	30.093	30.282	2d.	29.910	13th.	.372	92.2	63.9	90.0
Portsmouth.....			30.104	30.364	28th.	29.806	12th.	.558	86.4	65.3	88.0
Waverly.....			30.093	30.317	28th.	29.883	12th.	.434	82.0	66.6	91.5
Georgetown.....			30.092	30.291	28th.	29.909	12th.	.382	84.2	65.1	88.5
Columbus.....			30.118	30.362	28th.	29.884	13th.	.478	77.3	63.1	87.0
O. S. University.....			30.104	30.368	28th.	29.872	12th.	.496	83.4	61.4	87.0
Westerville.....	1.10	0.50	30.096	30.370	28th.	29.860	13th.	.510	88.0	60.2	84.0
Logan.....			30.109	30.322	28th.	29.896	13th.	.426	86.8	62.7	92.0
Oberlin.....			30.143	30.415	29th.	29.868	13th.	.577	93.2	60.6	86.0
Marietta.....			30.125	30.349	28th.	29.922	13th.	.427	84.8	64.4	87.0
McConnellsville....			30.102	30.328	28th.	29.876	13th.	.452	87.1	64.1	88.0
Pomeroy.....			30.117	30.384	29th.	29.959	13th.	.325	88.0	65.9	87.8
Athens.....			30.138	30.352	28th.	29.928	13th.	.424	82.7	63.4	88.0
Granville.....			30.101	30.336	28th.	29.868	13th.	.468	82.2	61.6	85.8
Newcomerstown.....			30.114	30.373	28th.	29.913	13th.	.460	86.5	60.6	89.0
New Alexandria.....									83.8	62.1	84.0
Canton.....			30.111	30.385	28th.	29.845	13th.	.540	.....	61.4	86.4
Youngstown.....	1.17	1.20	30.100	30.376	28th.	29.839	13th.	.537	85.9	61.2	85.0
Hiram.....			30.119	30.396	28th.	29.880	13th.	.516	83.1	59.4	83.8
Wooster.....	2.70	1.57	30.129	30.413	28th.	29.871	13th.	.542	83.8	59.6	88.0
Cleveland (S. O.)...			30.134	30.414	28th.	29.841	13th.	.573	83.6	62.0	89.0
Cleveland (Hyde)...										60.5	86.8
Akron.....	0.27	0.00	30.143	30.387	28th.	29.845	13th.	.542	83.6	60.6	85.7
Hudson.....											
Weymouth.....											
Ellsworth.....											
Ashland.....											
Lordstown.....											
Tiffin.....											
Bellevue.....											
Garrettsville.....											
Kenton.....											
Waynesville.....											
Springboro.....											
Jacksonburg.....											
Circleville.....											
State.....			30.118	30.455	28th.	29.806	12th.	.649	83.9	62.1	92.0

The mean atmospheric pressure, 30.118 inches, was .052 inch above the average for September. The highest barometer, 30.455 inches, occurred at Wauseon on the 28th, and the lowest, 29.806 inches, at Portsmouth, on the 12th. The mean temperature for the northern section was 60° 5; for the middle section, 61° 4; and for the southern section, 64° 4. These means are 1° 5, 2° 1 and 0° 7 below the averages for the sections for September. The mean for the state, 62° 1, was 1° 4 below the average. The maximum temperature was 92° on the 7th at Sandusky and Logan, and the minimum temperature was 33° on the 29th at Findlay. The mean daily range of temperature was 19° 4. The greatest daily range was 44°, on the 20th, at Pomeroy, and the least, 4°, on the 10th at Logan, Newcomerstown and Akron, and on the 20th at Cleveland, (S. O.) Light frost was general from all sections on the 14th, 21st, 28th and 29th, and from the northern and middle sections on the 1st, 24th and 25th. Killing frost occurred at Findlay on the 14th, 21st and 29th; Wauseon on the 21st, and Tiffin and Newcomerstown on the 29th. No serious damage was reported. The mean relative humidity, 83.9 per cent., was 6.7 per cent. above the average. Precipitation was general in all sections on the 5th, 6th, 8th, 9th, 10th, 11th, 12th, 13th, 16th, 19th, 25th, 26th and 27th, and local in all on the 4th, 7th and 15th. Local rains occurred in the middle and southern sections on the 14th, 22d, 29th and 30th. The precip-

THE STATE BOARD OF HEALTH BY THE OHIO METEOROLOGICAL BUREAU.

Date.	Lowest temperature.	Date.	Range of temperature.	Mean daily range of temperature.	Greatest daily range of temperature.	Date.	Least daily range of temperature.	Date.	Number of clear days.	Number of fair days.	Number of cloudy days.	Days on which rain fell, with 0.1 rainfall.	Total rainfall for month.	Average daily rainfall.	Direction of wind.
7th.	41.0	28th.	48.0	17.4	28.0	21st.	8.0	9th.	8	11	14	14	3.28	.109	N. E.
7th.	39.0	28th.	48.5	19.5	31.0	.....	8.0	30th.	12	8	10	10	7.37	.246	S. W.
8th.	36.0	1st.	52.0	24.7	38.0	1st.	10.0	12th.	15	9	6	8	4.31	.144	S. W.
7th.	38.0	14th.	45.5	16.0	28.5	2d.	5.0	9th.	11	12	7	11	4.52	.151	S.
7th.	38.0	28th.	46.0	16.3	28.5	29th.	5.0	.....	7	11	12	8	4.89	.163	S. W.
.....	37.0	21st.	47.0	18.6	29.0	24th.	6.0	2th.	8	13	9	11	5.58	.186	N. E.
7th.	33.0	29th.	55.0	22.8	36.0	2d.	6.3	26th.	9	13	8	7	2.67	.089	N. E.
7th.	34.3	21st.	51.0	23.3	39.7	2d.	6.5	11th.	10	13	7	13	3.19	.106	N. E.
7th.	39.1	28th.	47.9	19.5	31.2	21st.	8.3	26th.	9	10	11	13	1.91	.064	S. E.
7th.	38.0	21st.	53.0	21.9	39.0	2d.	7.0	10th.	11	13	6	11	8.20	.273	N. W.
8th.	35.0	28th.	50.5	19.7	27.2	21.	7.5	10th.	10	14	6	13	5.29	.176	S. W.
7th.	38.0	28th.	49.0	15.6	31.0	23d.	5.0	.....	9	9	12	10	2.65	.089	N. E.
7th.	43.0	21st.	49.0	15.4	28.0	23d.	5.0	9th.	9	9	12	10	4.15	.138	S. W.
8th.	40.0	20th.	50.0	22.1	35.0	.....	7.0	9th.	4	15	11	15	4.12	.137	E.
.....	45.5	.....	42.5	19.1	34.5	2d.	5.5	9th.	11	10	9	14	4.40	.147	S. W.
8th.	45.5	29th.	46.0	19.3	31.0	2d.	6.5	10th.	11	9	10	14	6.04	.201	N. E.
.....	42.0	28th.	46.5	19.1	31.0	14th.	7.5	10th.	7	8	15	11	2.17	.072	N. E.
7th.	38.0	28th.	49.0	17.2	28.0	2d.	6.0	10th.	10	11	9	14	7.13	.238	S.
.....	26.0	28th.	51.0	20.6	32.0	21st.	7.0	10th.	7	17	6	15	8.16	.272	S.
.....	36.5	2th.	47.5	18.6	31.5	2d.	5.0	10th.	12	12	6	12	8.16	.272	S.
7th.	38.0	21st.	54.0	23.5	41.0	2d.	4.0	10th.	10	11	9	11	8.44	.281	S. E.
.....	38.0	.....	48.0	18.1	31.0	2d.	5.0	26th.	10	8	12	11	3.78	.126	S. W.
8th.	42.0	29th.	45.0	20.6	32.2	1st.	8.5	9th.	7	11	12	13	8.87	.296	N.
8th.	38.4	21st.	50.3	21.2	36.1	2d.	5.5	.....	11	7	12	15	6.55	.218	N.
8th.	38.0	29th.	49.5	25.5	41.0	20th.	13.0	9th.	14	6	10	12	4.11	.137	W.
7th.	41.0	29th.	47.0	21.9	32.0	.....	9.5	.....	8	12	10	0	6.46	.215	S. W.
.....	37.0	28th.	44.8	20.5	30.4	2d.	7.1	12th.	9	13	6	11	7.33	.244	S. W.
7th.	35.0	29th.	54.0	22.4	39.5	3d.	4.0	10th.	9	13	8	11	8.89	.296	E.
8th.	35.0	28th.	49.0	18.0	32.0	2d.	7.0	10th.	8	8	14	12	7.61	.254	S.
7th.	36.0	28th.	50.4	21.0	35.2	4th.	5.7	9th.	9	11	10	12	6.88	.229	S. W.
7th.	34.5	28th.	50.5	20.2	26.0	3d.	5.5	10th.	12	8	10	12	7.53	.251	S.
7th.	37.0	29th.	48.8	18.5	28.8	25th.	5.7	20th.	3	8	9	9	4.67	.156	S. W.
7th.	34.0	.....	50.0	20.6	37.0	2d.	4.5	10th.	10	11	9	11	5.12	.171	S.
7th.	42.0	25th.	47.0	16.4	28.0	2d.	4.0	20th.	9	10	11	13	5.58	.186	S. E.
7th.	41.0	23th.	45.8	17.5	30.7	2th.	7.6	.....	8	11	11	15	5.52	.184	S.
7th.	38.2	29th.	47.6	18.1	30.5	2d.	4.0	10th.	7	12	11	11	6.56	.219	S.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	10	5.31	.177	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	8	5.31	.177	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	10	6.4	.211	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	9	4.53	.151	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	11	6.94	.231	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	11	2.54	.084	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	7	2.53	.084	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	14	4.33	.144	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	13	6.59	.220	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	12	5.13	.171	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	10	4.82	.164	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	8	3.30	.110	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	11	3.29	.110	.....
7th.	33.0	29th.	59.0	19.4	41.0	20th.	4.0	.....	9.5	10.7	9.7	11.4	5.56	.185	S. W.

itation was largely in excess of the usual amount in all sections. Fifty-three out of a total of fifty-eight stations report rainfalls of one inch or more, and fourteen stations report rainfalls of two and one-half inches in twenty-four consecutive hours. The mean rainfall in the northern section was 1.84 inches; in the middle section 6.86 inches, and in the southern section 4.98 inches. These means are 1.54 inches, 3.23 inches and 1.97 inches above the averages for the section. The mean for the State, 5.56 inches, is 2.25 inches above the average for September, and is the largest September rainfall since the opening of the Bureau. The greatest monthly rainfall was 8.89 inches at Newcomerstown, and the least, 1.91, at Clarksville. The highest wind velocities reported during the month were 22 miles N. E. at Columbus and Cincinnati on the 28th; 29 miles S. W. at Cleveland on the 19th; 40 miles S. W. at Toledo, and 33 miles N. W. at Sandusky on the 13th, and 27 miles at Ohio State University on the 5th. The greatest daily movement was 362 miles at Toledo, date not given, and the least, 54 miles at Columbus on the 22d. Total movement—Cincinnati, 4,204 miles; Columbus, 3,622 miles; Cleveland, 5,622 miles; Toledo, 5,341 miles; O. S. University, 5,168 miles, and Sandusky 6,058 miles. The percentage of verification of weather signals received from Washington and distributed to twenty-one display stations, computed from reports of the observers, was 89 for weather and 88 for temperature.

METEOROLOGICAL OBSERVATIONS FOR THE MONTH OF OCTOBER, 1890, FURNISHED

Stations.	Ozone. Monthly mean.		Mean barometer.	Highest barometer.	Date.	Lowest barometer.	Date.	Range of barometer.	Mean relative humidity.	Mean temperature.	Highest temperature.
	7 A. M. to 2 P. M.	9 P. M. to 7 A. M.									
Cincinnati			29.999	30.248	31st.	29.473	29th.	.775	79.4	65.5	84.0
Dayton	0.72	0.89	29.972	30.238	2 st.	29.426	29th.	.812	82.1	54.4	82.0
Wapakoneta			29.951	30.246	21st.	29.404	29th.	.842	89.8	55.0	76.0
Greenville			29.940	30.225	9th.	29.416	29th.	.809	89.0	52.1	79.0
Cellua			29.962	30.259	22d.	29.424	29th.	.835	86.3	53.4	80.0
Upper Sandusky	3.74	3.36	29.920	30.242	22 d.	29.371	29th.	.871	92.0	52.6	79.0
Fostoria			29.960	30.292	22d.	29.369	29th.	.923	83.2	51.7	82.0
Findlay			29.940	30.297	22d.	29.341	29th.	.956	87.4	51.0	82.0
Wauseon	1.84	1.71	29.958	30.302	22d.	29.355	29th.	.947	81.1	50.1	81.6
Clarksville	2.71	2.68	29.997	30.279	3 st.	29.452	29th.	.87	82.5	52.8	83.0
Yellow Springs			29.910	30.192	22d.	29.346	29th.	.846	83.4	53.3	
North Lewisburg	0.42	1.52	29.964	30.283	9th.	29.442	29th.	.841	83.8	53.1	83.0
Bangorville			28.522	28.800	2 st.	27.844	29th.	.956	84.4	50.3	78.5
Toledo			29.962	30.301	22d.	29.330	29th.	.871	80.3	50.1	80.0
Sandusky	0.80	1.13	29.944	30.280	22d.	29.275	29th.	1.005	79.2	53.6	84.0
Hanging Rock	0.35	0.32	29.972	30.256	31st.	29.428	29th.	.828	86.4	55.0	85.0
Portsmouth			29.979	30.228	31st.	29.421	29th.	.807	84.8	54.6	84.5
Waverly			29.861	30.60	30th.	29.328	29th.	.942	80.9	56.0	85.0
Georgetown			29.982	30.236	31st.	29.448	29th.	.778	83.8	54.4	85.0
Columbus			29.968	30.232	9th.	29.369	29th.	.863	79.2	53.8	82.0
O. S. University			29.951	30.252	9th.	29.361	29th.	.891	83.7	5.3	82.0
Westerville	0.57	0.62	29.933	30.232	9th.	29.329	29th.	.903	87.0	52.2	79.5
Logan			29.962	30.224	21st.	29.322	29 h.	.902	86.5	53.6	85.0
Oberlin			29.955	30.311	22d.	29.362	29th.	.949	88.8	50.3	78.0
Marietta			29.976	30.283	9th.	29.346	26th.	.937	83.5	54.7	81.2
McConnelville			29.956	30.232	22d.	29.338	29th.	.894	87.0	53.4	82.5
Pomeroy			30.003	30.278	31st.	29.459	29th.	.819	85.7	54.7	83.0
Athens			29.999	30.297	9th.	29.435	29th.	.862	82.5	53.0	81.0
Newcomerstown			29.944	30.276	9th.	29.369	29th.	.967	87.4	51.2	80.5
New Alexandria									88.0	51.6	74.0
Canon			29.934	30.290	22d.	29.313	29th.	.977		51.8	77.5
Youngstown	1.29	1.23	29.919	30.254	22d.	29.342	29th.	.912	86.3	52.4	76.0
Hiram			29.941	30.307	21st.	29.337	29th.	.970	87.4	49.5	76.2
Jefferson			29.959	30.312	22d.	29.418	29th.	.899	86.7	49.3	77.0
Wooster	2.77	1.84	29.928	30.312	22d.	29.354	29th.	.958	86.0	50.0	81.0
Cleveland (S. O.)			29.941	30.309	22d.	29.320	29th.	.989	81.2	53.2	81.0
Cleveland (Hyde)										52.9	80.8
Akron	0.0	0.0	29.931	30.293	22d.	29.322	29th.	.971	86.9	51.4	77.9
Hudson											
Weymouth											
Ellsworth											
Ashland											
Lordstown											
Tiffin											
Bellevue											
Garrettsville											
Kenton											
Waynesville											
Springboro											
Jacksonburg											
Circleville											
State			29.956	30.312	22d.	29.275	29th.	1.037	87.6	51.7	85.0

The mean atmospheric pressure, 29.956 inches, was .120 inch below the average, and is the lowest mean monthly pressure recorded since the opening of the Bureau for October. The highest barometer, 30.312 inches, occurred at Jefferson and Wooster on the 22d, and the lowest, 29.275 inches, at Sandusky on the 29th. The mean temperature for the northern section was 51° 3'; for the middle section, 52° 5'; for the southern section, 54° 3', and for the State, 52° 7'. These means are 1° 2', 1° 6', 1° 3' and 1° 4' above the averages for the sections and State for October. The highest temperature for the month, 85° 0, occurred on the 12th at Georgetown and Logan, and on the 13th at Hanging Rock, Waverly and Logan. The lowest temperature was 28° 7, at Yellow Springs on the 30th. Light frost was reported from all sections on the 5th, 18th, 19th and 20th, and heavy frost from all, on the 21st, 30th and 31st. Heavy frosts also occurred in the northern and middle sections on the 20th, 22d and 28th. Ice was reported generally on the 30th and 31st. The mean relative humidity 87.6 per cent, was 8.9 per cent above the average. Precipitation was general in all sections on the 1st, 2d, 3d, 4th, 5th, 6th, 11th, 12th, 13th, 16th, 18th, 19th, 23d, 24th, 25th, 26th and 29th, in the northern and middle sections on the 10th, 14th, 20th, 27th, 28th and 30th, and in the southern section on the 22d. Local rains occurred in all sections

THE STATE BOARD OF HEALTH BY THE OHIO METEOROLOGICAL BUREAU.

Date.	Lowest temperature.	Date.	Range of temperature.	Mean daily range of temperature.	Greatest daily range of temperature.	Date.	Least daily range of temperature.	Date.	Number of clear days.	Number of fair days.	Number of cloudy days.	Days on which rain fell, with 0.1 rainfall.	Total rainfall for month.	Average daily rainfall.	Direction of wind.
13th.	34.0	31st.	50.0	15.0	26.0	9th.	7.0	26th.	4	13	14	21	4.14	.134	S. W.
13th.	30.0	31st.	52.0	17.0	28.0	9th.	8.0	26th.	7	13	11	12	2.42	.078	S. W.
.....	30.0	31st.	46.0	19.4	32.5	21st.	8.0	29th.	8	15	10	10	1.60	.052	S. W.
.....	29.0	31st.	50.0	14.3	25.0	9th.	4.0	23d.	6	15	10	10	1.45	.047	S. W.
.....	30.5	30th.	49.5	15.3	26.0	18th.	7.0	4th.	2	11	18	10	2.37	.076	N. W.
13th.	30.0	30th.	49.0	15.3	26.0	15th.	8.0	.....	2	11	18	20	3.43	.111	N. W.
13th.	30.0	.....	52.0	16.4	33.0	13th.	6.0	23d.	4	23	13	9	2.45	.079	W.
13th.	30.0	.....	52.0	17.7	25.0	18th.	6.0	23d.	10	17	12	12	4.20	.136	S. W.
13th.	29.1	21st.	52.5	18.0	30.3	9th.	6.8	5th.	10	19	17	17	3.76	.121	N. W.
13th.	31.3	31st.	51.7	17.2	30.7	9th.	5.4	23d.	5	11	15	15	3.38	.109	W.
.....	28.7	30th.	.....	.....	.....	.....	.....	.....	.....	.....	.....	13	232	.075	N. W.
13th.	30.0	30th.	53.0	18.1	32.0	.....	6.0	29th.	8	.....	15	11	3.45	.111	W.
13th.	28.8	30th.	49.7	16.3	28.5	12th.	9.7	26th.	8	8	19	16	1.20	.035	S. W.
13th.	31.0	31st.	49.0	13.8	24.0	13th.	5.0	16th.	4	6	21	17	3.93	.127	N. W.
13th.	31.0	30th.	55.0	13.3	28.0	13th.	4.0	23d.	1	8	22	26	4.66	.150	N.
13th.	29.0	31st.	56.0	20.7	39.0	18th.	11.0	.....	2	15	14	14	3.74	.121	S. W.
13th.	34.0	30th.	50.5	17.5	32.5	18th.	5.0	.....	7	10	14	12	3.87	.125	S. W.
13th.	34.0	30th.	51.0	17.5	32.5	18th.	5.0	.....	9	8	14	15	4.31	.139	S. W.
12th.	30.0	.....	55.0	18.4	37.0	17th.	4.0	27th.	7	3	21	14	4.60	.148	S. W.
13th.	33.0	30th.	49.0	14.3	28.0	12th.	5.0	11th.	5	10	16	14	3.02	.097	S.
13th.	31.0	30th.	51.0	17.2	31.0	9th.	4.0	26th.	6	12	13	14	2.71	.087	S.
12th.	33.0	.....	46.5	15.4	28.5	12th.	5.5	24d.	5	10	16	15	2.53	.082	N. W.
.....	30.0	30th.	55.0	20.0	37.0	9th.	7.0	26th.	4	8	19	12	3.98	.128	S. E.
12th.	31.0	30th.	47.0	12.9	23.0	17th.	4.0	29th.	4	9	18	13	5.84	.172	W.
13th.	36.0	31st.	45.2	14.9	26.2	9th.	5.7	27th.	3	11	17	16	5.11	.166	W.
13th.	33.1	31st.	49.5	18.0	38.0	9th.	7.0	.....	5	6	20	13	3.74	.121	S.
13th.	31.4	30th.	52.0	20.5	37.0	10th.	5.5	24th.	8	6	19	9	2.47	.080	W.
13th.	30.5	.....	50.5	19.7	39.5	15th.	6.0	29th.	8	11	12	9	3.84	.124	N. W.
13th.	30.0	31st.	50.5	18.0	34.5	10th.	6.0	23d.	4	12	15	16	4.53	.144	W.
13th.	30.0	31st.	44.0	13.7	26.0	9th.	5.0	23d.	4	9	18	11	6.00	.96	S. W.
13th.	31.0	31st.	46.5	15.9	32.3	8th.	5.0	24d.	3	9	19	18	6.59	.212	S. W.
10th.	32.0	.....	41.0	17.6	27.2	.....	5.5	24th.	4	6	21	15	5.62	.181	S.
13th.	30.0	30th.	46.2	13.1	27.2	13th.	3.7	29th.	4	11	16	21	7.74	.250	S. W.
2d.	32.0	31st.	38.0	12.9	25.0	15th.	4.0	23d.	4	9	18	22	8.29	.267	S. W.
13th.	29.5	31st.	51.5	15.5	29.5	13th.	5.5	23d.	2	10	19	18	7.45	.240	W.
13th.	33.0	30th.	48.0	13.0	28.0	13th.	5.0	27th.	1	10	20	25	5.85	.189	S. W.
13th.	33.0	30th.	47.8	13.6	30.5	13th.	5.8	29th.	2	12	17	23	6.74	.217	S.
13th.	31.5	30th.	46.4	13.7	25.4	8th.	5.4	27th.	3	9	19	19	6.23	.201	N. W.
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	19	7.38	.238	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	12	5.77	.186	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	20	5.37	.173	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	16	5.42	.175	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	21	6.36	.205	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	23	5.80	.187	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	12	4.95	.160	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	20	7.31	.236	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	19	5.34	.172	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	11	3.05	.099	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	10	3.08	.100	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	12	1.80	.058	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	15	3.08	.100	.....
.....	28.7	30th.	56.3	16.3	39.5	15th.	3.7	29th.	4.5	10.0	16.5	15.5	4.27	.138	S. W.

on the 7th and 31st. The mean rainfall in the northern section was 5.54 inches; in the middle section 3.79 inches, and in the southern section 3.47 inches. These means are 2.79 inches, 1.13 inches and 0.60 inch above the averages for the sections respectively. The mean for the State, 4.27 inches, is 1.51 inches above the October average, and is the largest October rainfall since 1883. The greatest monthly rainfall was 8.29 inches at Jefferson, and the least, 1.45 at Greenville. The greatest amount in twenty-four consecutive hours was 3.82 inches at Wooster on the 12th and 13th. The highest wind velocities reported during the month were 38 miles W. at Cincinnati, and 36 miles W. at Columbus on the 18th; 29 miles N. W. at Cleveland on the 29th; 40 miles S. W. at Toledo on the 16th; 34 miles N. at Sandusky on the —th, and 40 miles W. at Ohio State University on the 18th. The greatest daily movement was 519 miles at O. S. University, on the 14th, and the least, 47 miles at Sandusky, date not given. Total movement—Cincinnati, 5,503 miles; Columbus, 5,380 miles; Cleveland, 5,831 miles; Toledo, 5,773 miles; Sandusky, 6,133 miles, and O. S. University, 7,346 miles. The percentage of verification of weather signals received from Washington, computed from reports of the observers, was 82 for weather and 89 for temperature.

TABLES SHOWING
DAY AND NIGHT OBSERVATIONS FOR OZONE,

TAKEN BY MEANS OF SCHOENBEIN'S TEST PAPER.

RECORDED ACCORDING TO A SCALE OF TEN DEGREES OF COLORATION.

TABLES SHOWING DAY AND NIGHT OBSERVATIONS FOR OZONE, TAKEN BY MEANS OF SCHÖNBEIN'S TEST-PAPER, RECORDED ACCORDING TO A SCALE OF TEN DEGREES OF COLORATION.—Continued.

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TABLES SHOWING DAY AND NIGHT OBSERVATIONS FOR OZONE, TAKEN BY MEANS OF SCHÖNBEIN'S TEST-PAPER, RECORDED ACCORDING TO A SCALE OF TEN DEGREES OF COLORATION.

December, 1889.																															
Stations.																															
1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16	
Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.
Akron.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Celina.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Clarksville.....	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Dayton.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Greenville.....	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Hanging Rock.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
North Lewisburg.....	1	0	3	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Portsmouth.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sandusky.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Upper Sandusky.....	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Wauseon.....	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Westerville.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Wooster.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Youngstown.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Stations.

TABLES SHOWING DAY AND NIGHT OBSERVATIONS FOR OZONE, TAKEN BY MEANS OF SCHÖNBEIN'S TEST-PAPER, RECORDED ACCORDING TO A
SCALE OF TEN DEGREES OF COLORATION.

December, 1889—Cont'd.	17		18		19		20		21		22		23		24		25		26		27		28		29		30		31		Average day for the month.	Average night for the month.	
	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.			
Akron.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.03		
Celina.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1.03	1.03		
Clarksville.....	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3.80	4.00		
Day on.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4.33	4.13		
Greenville.....	0	2	5	4	0	4	2	6	6	7	7	4	1	0	0	2	4	0	0	7	1	3	1	3	0	6	7	2	4	0	4	3.16	4.13
Hanging Rock.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.06		
North Lewisburg.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.45	0.30		
Portsmouth.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00		
Sandusky.....	2	1	0	0	0	0	0	4	5	4	3	4	3	4	5	4	5	4	3	2	2	3	3	3	3	3	3	3	3	3	3.55	3.61	
Upper Sandusky.....	3	1	0	0	0	0	0	3	3	3	2	2	3	3	3	3	3	3	2	2	3	3	3	3	3	3	3	3	3	2.70	2.70		
Wauseon.....	0	0	0	0	0	0	0	3	3	3	2	2	3	3	3	3	3	3	2	2	3	3	3	3	3	3	3	3	3	2.36	1.50		
Westerville.....	0	0	0	0	0	0	0	3	3	3	2	2	3	3	3	3	3	3	2	2	3	3	3	3	3	3	3	3	3	2.23	2.03		
Wooster.....	0	0	0	0	0	0	0	3	3	3	2	2	3	3	3	3	3	3	2	2	3	3	3	3	3	3	3	3	3	1.13	1.13		
Youngstown.....	2	3	1	1	1	1	1	1	1	1	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1	1.13	1.13	

Stations.

TABLES SHOWING DAY AND NIGHT OBSERVATIONS FOR OZONE, TAKEN BY MEANS OF SCHONBEIN'S TEST PAPER, RECORDED ACCORDING TO A
SCALE OF TEN DEGREES OF COLORATION.

January, 1890—Concluded...	17		18		19		20		21		22		23		24		25		26		27		28		29		30		31		Average day for the month.	Average night for the month.
Stations.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.		
Akron.....	0	0	1	1	1	1	0	1	1	1	0	1	1	1	0	1	1	1	0	1	1	1	0	1	1	1	1	1	1	0	0.00	0.00
Celina.....	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.00	1.00	
Clarksville.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.75	4.30	
Dayton.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.43	1.40	
Greenville.....	6	6	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4.30	3.95	
Hanging Rock.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.97	0.97	
Logan.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0.00	
Sandusky.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.03	0.13	
Wauseon.....	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.40	2.36	
Westerville.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.86	1.87	
Wooster.....	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.32	2.32	
Youngstown.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.10	1.16	

TABLES SHOWING DAY AND NIGHT OBSERVATIONS FOR OZONE, TAKEN BY MEANS OF SCHÖNBEIN'S TEST-PAPER, RECORDED ACCORDING TO A
SCALE OF TEN DEGREES OF COLORATION.

March, 1890.....	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Stations.	Day.	Day.	Day.	Day.	Day.	Day.	Day.	Day.	Day.	Day.	Day.	Day.	Day.	Day.	Day.	Day.
	Night.	Night.	Night.	Night.	Night.	Night.	Night.	Night.	Night.	Night.	Night.	Night.	Night.	Night.	Night.	Night.
Akron.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Celina.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Clarksville.....	3	4	5	3	5	4	2	3	3	6	5	6	7	3	2	4
Dayton.....	1	0	1	1	1	1	2	3	2	6	3	6	3	0	1	0
Greenville.....	1	0	1	1	1	1	2	3	1	6	3	2	7	3	4	6
Hanging Rock.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sandusky.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Upper Sandusky.....	3	1	1	3	2	3	2	4	5	4	4	3	2	3	3	4
Wauseon.....	3	2	3	3	2	3	3	4	4	5	4	3	3	3	3	4
Westerville.....	2	2	3	2	1	3	1	4	4	4	4	3	3	2	2	4
Wooster.....	5	4	4	4	6	0	1	4	3	1	1	2	4	3	3	6

TABLES SHOWING DAY AND NIGHT OBSERVATIONS FOR OZONE, TAKEN BY MEANS OF SCHÖNBEIN'S TEST-PAPER, RECORDED ACCORDING TO A
SCALE OF TEN DEGREES OF COLORATION.

April, 1890—Concluded.....	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Average day for the month.	Average night for the month.
	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.
Akron.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.13
Clarksville.....	4	4	3	6	0	1	6	6	4	5	5	2	4	1	5	3.97
Dayton.....	4	4	0	5	1	1	7	7	3	3	6	5	4	6	6	4.37
Greenville.....	5	7	3	4	2	3	4	4	7	8	6	2	5	4	6	1.62
Hanging Rock.....	0	4	1	1	0	0	6	6	2	2	1	0	0	0	0	4.73
Handusky.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.67
Upper Sandusky.....	5	4	4	5	6	6	6	4	5	5	6	1	6	6	6	0.27
Wauseon.....	1	1	3	2	3	3	2	2	2	2	2	2	1	2	4	5.40
Westerville.....	8	2	1	4	2	2	3	4	3	1	6	3	4	5	5	2.07
Wooster.....	2	1	4	3	3	0	3	4	5	5	4	2	1	2	4	2.34
Youngstown.....	0	1	0	1	1	0	1	1	1	2	7	3	1	2	2	3.67
																4.20
																1.26

Stations.

G T OBSERVATIONS FOR OZONE, TAKEN BY MEANS OF SCHONBEIN'S TEST-PAPER, RECORDED ACCORDING TO A
SCALE OF TEN DEGREES OF COLORATION.

Stations.	1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16		
	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.			
June, 1890.....	1	3	0	6	2	0	1	2	0	3	0	1	0	2	1	3	1	3	0	4	3	0	0	6	0	4	0	4	2	4	0	0	2
Akron.....	3	7	3	7	3	0	1	2	0	3	0	1	0	2	1	3	1	3	0	4	3	0	0	6	0	4	0	4	2	4	0	0	2
Clarksville.....	5	7	3	7	3	0	1	2	0	3	0	1	0	2	1	3	1	3	0	4	3	0	0	6	0	4	0	4	2	4	0	0	2
Dayton.....	3	7	3	7	3	0	1	2	0	3	0	1	0	2	1	3	1	3	0	4	3	0	0	6	0	4	0	4	2	4	0	0	2
Greenville.....	3	7	3	7	3	0	1	2	0	3	0	1	0	2	1	3	1	3	0	4	3	0	0	6	0	4	0	4	2	4	0	0	2
Hanging Rock.....	3	7	3	7	3	0	1	2	0	3	0	1	0	2	1	3	1	3	0	4	3	0	0	6	0	4	0	4	2	4	0	0	2
North Lewisburg.....	3	7	3	7	3	0	1	2	0	3	0	1	0	2	1	3	1	3	0	4	3	0	0	6	0	4	0	4	2	4	0	0	2
Sandusky.....	3	7	3	7	3	0	1	2	0	3	0	1	0	2	1	3	1	3	0	4	3	0	0	6	0	4	0	4	2	4	0	0	2
Upper Sandusky.....	3	7	3	7	3	0	1	2	0	3	0	1	0	2	1	3	1	3	0	4	3	0	0	6	0	4	0	4	2	4	0	0	2
Wauseon.....	3	7	3	7	3	0	1	2	0	3	0	1	0	2	1	3	1	3	0	4	3	0	0	6	0	4	0	4	2	4	0	0	2
Westerville.....	3	7	3	7	3	0	1	2	0	3	0	1	0	2	1	3	1	3	0	4	3	0	0	6	0	4	0	4	2	4	0	0	2
Wooster.....	4	8	3	7	3	0	1	2	0	3	0	1	0	2	1	3	1	3	0	4	3	0	0	6	0	4	0	4	2	4	0	0	2
Youngstown.....	0	1	3	7	3	0	1	2	0	3	0	1	0	2	1	3	1	3	0	4	3	0	0	6	0	4	0	4	2	4	0	0	2

TABLES SHOWING DAY AND NIGHT OBSERVATIONS FOR OZONE, TAKEN BY MEANS OF SCHONBEIN'S TEST-PAPER, RECORDED ACCORDING TO A SCALE OF TEN DEGREES OF COLORATION.

June, 1890—Concluded.....	17		18		19		20		21		22		23		24		25		26		27		28		29		30		Average day for the month.	Average night for the month.
	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.		
Stations.																														
Atrol.....	1	0	0	0	0	0	0	0	0	2	3	0	0	1	0	0	0	2	0	0	0	1	0	0	0	1	0	.....	0.69	0.13
Clarksville.....	3	5	4	1	2	1	2	1	5	2	2	1	3	2	2	2	2	2	1	2	3	1	0	2	4	3	4	.....	2.86	3.27
Dayton.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	2	1	1	0	0	0	0	4	3	4	.....	2.50	2.50
Greenville.....	3	2	6	5	4	3	3	6	1	3	2	2	6	0	0	2	1	2	0	0	3	3	4	7	7	7	4	.....	4.52	4.27
Hanging Rock.....	2	0	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	7	7	7	7	7	7	4	.....	1.23	0.50
North Lewisburg.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.....	0.70	3.93	
Sandusky.....	0	2	0	0	1	1	1	1	1	1	1	1	1	1	1	3	2	2	2	2	5	6	6	6	9	1	2	.....	1.00	2.07
Upper Sandusky.....	1	2	0	0	2	2	2	2	2	2	2	2	2	2	2	6	6	6	6	6	2	2	2	2	9	1	2	.....	5.77	6.00
Wauson.....	2	7	4	4	5	5	5	5	5	5	5	5	5	5	5	7	6	6	6	6	2	2	2	2	9	1	2	.....	1.50	1.60
Westerville.....	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1	6	6	6	6	6	2	2	2	2	9	1	2	.....	2.37	1.19
Wooster.....	2	4	2	1	1	1	1	1	1	0	0	0	0	0	0	3	3	3	3	3	3	1	1	1	4	3	4	.....	3.19	1.64
Youngstown.....	3	0	5	1	1	1	1	2	3	0	1	1	0	1	0	2	1	2	0	1	2	2	2	2	4	5	0	.....	1.30	1.03

Stations.

TABLES SHOWING DAY AND NIGHT OBSERVATIONS FOR OZONE, TAKEN BY MEANS OF SCHONBEIN'S TEST-PAPER, RECORDED ACCORDING TO A SCALE OF TEN DEGREES OF COLORATION.

September—Concluded.		17		18		19		20		21		22		23		24		25		26		27		28		29		30		31.		Average day for the month.	Average night for the month.
		Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.		
Dayton		0	1	0	3	1	5	3	4	3	5	0	0	0	4	1	5	4	7	0	3	6	3	1	3	3	1	1	5		0.93	1.93	
Upper Sandusky		5	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	.....	4.43	4.13		
Wauseon		2	0	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	.....	1.73	1.50		
Clarksville		4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	.....	2.17	2.24		
Sandusky		2	4	1	0	1	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	.....	.77	1.10		
Hanging Rock		1	1	0	0	1	1	1	1	1	1	1	1	1	0	0	1	1	0	0	1	1	2	2	2	2	2	2	.....	.70	.50		
Weterville		1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	.....	1.10	1.20		
Youngstown		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	.....	1.17	1.17		
Wooster		5	1	2	2	3	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	.....	2.70	1.57		
Akron		0	0	0	0	1	1	1	1	1	1	1	1	1	1	2	4	1	0	0	0	1	1	0	0	0	0	0	.....	.27	0.00		

THE ART OF PROLONGING LIFE.

ANNUAL ADDRESS

BY

D. H. BECKWITH, M. D.,
President of the State Board of Health,

DELIVERED IN

COLUMBUS, OHIO,

September 24, 1890.



THE ART OF PROLONGING LIFE.

BY D. H. BECKWITH, M. D.

"Life is the gift of God and is divine."

GENTLEMEN: If the length of my remarks should correspond with the nature of my subject, I fear you would forestall my conclusions; and so, while wishing life were longer, you might wish addresses were shorter. But I promise you that, though a short address on a long subject may seem an anomaly, I shall endeavor to perform that rare feat this evening.

The desire for life is well nigh universal; here and there, we meet with men and women, who earnestly wish they were dead or could die. And we know that the statistics of suicide show an almost alarming number, who voluntarily put an end to their existence. These exceptions, however, prove the rule. Men prefer living to dying. A few years ago the world was startled by Mr. Mallock, who propounded the question: "Is Life Worth Living?" His book had a wide circulation, and it has constituted a never-to-be-forgotten epoch in the history of human thought.

We had all taken it for granted that life—except under extraordinary circumstances—was desirable. But you see, it was much like a firm doing business, involving a large amount of capital, employing a large number of men, consuming a variety of material, and manufacturing and selling certain kinds of goods.

Suppose you had such a firm before you, and you say to them: "Is it worth while to carry on your business?" And the firm replies: "Certainly it is. Look at our accounts. We have been in business ten years. Our yearly balance sheet shows a big amount in excess on the credit side."

Now, human life is a transaction, involving large and important interests. We are each busily working out the results.

These results are two: On the debit side is pain; on the credit side is pleasure. And we all keep going on, with only the vaguest idea as to the results, viewed from a business standpoint.

Mr. Mallock's query set us all on a new track of thinking. Its answer was equivalent to making up a balance sheet of our lives, and so find, if we could, whether the debit or the credit side was the larger. In other words, does life give us more pleasure than pain? For more than a decade this question has held a foremost place in the minds of thinkers.

Our literature has been flooded with answers. Sermons have been preached; books have been printed; pamphlets have been written and orations have been delivered, in order to settle this vexing question. Poets, too, have had their say. Burns in a fit of despondency cries:

"Oppressed with grief, oppressed with care,
A burden more than I can bear
I set me down and sigh:
O Life, thou art a galling load
Along a rough and weary road
To wretches such as I."

I know at least one satisfactory reply. A humorist was asked, Is life worth living? and he promptly replied: "That depends upon the liver."

Well, leaving out the liver, and the stomach too, for that matter, together with the nerves, we have to meet this question on the broad ground everywhere occupied by the human race, before we can go on with the discussion of the subject we have especially taken in hand.

We may state it:

THE ART OF PROLONGING LIFE.

Now, whether there be any use in giving time and attention to such a subject, depends. If life is not worth living, we need not concern ourselves about prolonging it. Under that condition, we might better seek after *The Art of Shortening Life*.

I think some one—a Frenchman most likely—has written a book on "Suicide as a Fine Art."

I suppose we would none of us care to give it a study. We all prefer to live, but wherefore? Well, suppose we decide that life is worth living; we know the inexorable law of Nature, that life must end in death. We know also, that a wise man said: Our years are three score years and ten, expressing thereby, the physiological limit set to the life of man.

Do you know that this estimate, made many thousands of years ago, shows a wonderful knowledge on the part of its author?

Since his day, Science has taken hold of the question and the result of the most elaborate and careful observations has been to place the physiological limit of human life just where this wise Jew placed it—three score years and ten.

The death of man, comes with the death of all living things, as a law of Nature. He is worn out, and ceases therefore to continue. It was once thought that physical death was caused by a special decree of the Almighty. There may be those who still think that if it had not been for sin, the body of man would have remained immortal.

Now, suppose that this were the case, we have the question easily answered: the art of prolonging life is simply to cease sinning.

To be sure we have a class among us, quite modern, who avow this openly, not as a philosophic truth merely, but as a thoroughly practical fact, and one applied to disease as easily as to death.

Our answer to this is: If your theory be true prove it by demonstration.

The nature and causes of the death of the body are questions that lie within the province of natural science. Now, what does science say? It says: Every form of life has its special type of existence. From the tiny object that sports a short hour in the sunbeam, and then dies, to the pondrous elephant, whose life covers more than a century, we have, I say, between these, a myriad of beings, each class of which follows its own type; has its definite limit of existence, and, like man, "dies when its time comes."

Gentlemen, this is the source of the unity and harmony of Nature. Only in this way, can Nature maintain an equilibrium of existence, among the innumerable creatures that swarm the surface of the earth.

I shall not attempt to settle Mr. Mallock's question, by any irrefragible demonstration. It can never be made plain to every body, that life is worth what it costs to prolong it.

I believe that the love of life is instinctive in every human being. Only by some dreadful catastrophe, whether it be like the explosion of dynamite, or like the insidious and fatal work of dry rot—only until calamity or decay has done its worst, does the largest or the most insignificant soul lose its love of life. Yet not all.

"When all the blandishments of life are gone
The coward sneaks to death."

But one more nobly sings:

"Tell me not in mournful numbers
Life is but an empty dream."

And loving it, what more natural than its continuance should be, if possible, preserved. This was the wild dream of centuries ago. When Ponce de Leon crossed unknown seas in search of the fountain that would give eternal youth, he was driven by the breath of many ages, whose sighs for immortality had been blowing across centuries. DeLeon has had many successors who, not daunted by his failures, still pursue the ever eluding *ignis fatuus*.

The old alchemist, who in the privacy of his cell, sought for that touchstone that could turn all baser metals to gold, kept his eye always on the possibility of finding that wonderful something which would forever cheat old age and death. The most modern exemplification of this

hope, which has never quite died out of the human breast, was the almost universal craze in the use of Dr. Brown Sequard's Elixir of Life.

This venerable Parisian doctor doubtless thought he had found what, in all ages, had been sought for: "The Art of Prolonging Life."

Scarcely had he whispered it to the air before the swift telegraph carried it to the bounds of civilization; and, not waiting to learn the exact conditions of his method, thousands of physicians—educated and experienced men, whom we might suppose knew something of the laws of pathology and physiology—sieved upon the idea, with the zeal of men living in the Dark Ages, and vainly attempted to defeat the laws of nature by giving to hopelessly diseased and worn out bodies a new and indefinite lease of life. How futile the effort! We may easily cheat our fellow-men, we may shuffle and play our cards—pardon the illustration, gentlemen,—so as to secure a prize against odds, we may delude the weak and snatch ill-gotten gains from the ignorant, but, gentlemen, we can not cheat death.

Over against this law of limitation, which nature has decreed as to the life of man, we may set the frequent but yet anomalous occurrences of lives greatly prolonged beyond the normal limit. The latest I have seen is that of a man still living at the age of 127. It is, however, considered a matter of no small interest when we find a man or woman reaching the age of 100. But while we find with great frequency persons of 75 or 80 years we never fail to note that they are always "in the sere and yellow leaf."

In years gone by they bravely mounted the rising hill of life, youth and ambition giving wings to their feet, until, like the sun which rose in grandeur and swept upward from horizon to zenith, they stand at the summit of life, the highest type of all that is glorious on earth.

" 'Tis the greatest thing, I think, to be a man.
 Man fells the forests, plows and tills the fields,
 And heap the granaries that feed the world.
 At his behest swift commerce spreads her wings,
 And tires the sinewy sea-bird as she flies,
 Fanning the solitude from clime to clime.
 Smoke-crested cities rise beneath his hand
 And roar through ages with the din of trade.
 Steam is the fleet-winged herald of his will.

* * * * *

And with one foot upon the conquered sea,
 And one upon the conquered land proclaims
 That space shall be no more.

* * * * *

————— 'Tis a great thing to be a man."

"Time and tide wait for no man." The acme gained, forthwith and without delay the descent begins. Gray hairs adorn the brow; ominous wrinkles make the face more calm and sedate, and just as imperceptibly as the babe grew to be a man, so the man, almost unnoticed, comes at last to old age.

" 'Tis but an hour ago since it was nine;
And after one hour more 't will be eleven.
And so from hour to hour we ripe and ripe,
And then from hour to hour we rot and rot."

This idea, so truthfully expressed by our king of poets, is far more beautifully expressed by another:

"—— age, that melts with unperceived decay,
And glides in modest innocence away;
Whose peaceful day benevolence endears,
Whose night congratulating conscience cheers;
The general favorite as the general friend.
Such age there is, and who shall wish it end?"

And here, gentlemen, we are carried back to our original question. If we earnestly set about prolonging human life which of the "seven stages" shall it be? Shall we have our infancy indefinitely extend, so that, having lived to five and forty years, a man would still be

"An infant, mewling and puking
In the nurse's arms?"

Beautiful as a babe may be, we must reject on purely business grounds, the idea of such prolonged nursing. Would you have youth kept at kite and top and ball, or carrying books and slate to school, through long years? Ah, what a paradise this would be for pedagogues?

Would you have our beautiful maidens and our noble boys go on for years skating, dancing, flirting and love-making, forced to do it because they were obliged to wait so long before they could assume the nobler duties of life?

Surely, you would not ask that men and women grown to maturity, who had spent years in the arduous duties of life—you would not ask that they should be kept like galley-slaves at the oar for many years to come, with the fruition of their life's work put far away in the future?

Gentlemen, there is such a thing as being tired. An hour's rest may renew youth; a day's rest may suffice for maturity, but there comes a time when this body of ours gets tired clear through, and it needs must have such years of rest as only old age can give to it. Said a good woman,

who had reached this limit: "O, I long for the time when I can put on a clean apron and sit down in the kingdom of heaven."

"Shoot him on the spot," said the brave General Dix. "Aye, aye sir," responded the soldier, "but which spot?" So difficult will it be for us to select what part of life to prolong.

Need I go on? The octogenarian stands like a solitary oak, in a wide waste, where its companions have long since fallen and crumbled to dust.

What is human life worth? Ask the god Mars, when he leads his battalions to war; ask the pestilence when it sweeps over the land; ask the cyclone; ask the mad conflagration. They will tell you life is cheap. But, gentlemen, with advancing civilization the value of human life is steadily appreciating.

We have awakened to a realizing sense of our duties in saving life. Sanitary science is born—the noblest daughter of the 19th century, and she is now, nobly laboring to save the human race from premature death. Already she has done a great work and yet she is but just begun.

Would you prolong life? give sanitary science your ardent support. She builds a great wall of safety around our happy homes and she hovers like a protecting angel over the cradle of our children.

Gentlemen, if I would redeem my pledge I must hasten to a close. The art of prolonging life is no secret. It is as plain as the shining sun. The art of prolonging life, is obedience to the laws of nature. Do you want a modern Moses to show you these laws written on stony tablets? I fear if he were to come, he would break his tablets over the head of the golden calf, which we all are worshipping in defiance of the laws of nature.

Why should we live rebellious all our lives and hope to escape just punishment by complaint or penitence? Prayers will not save you; medicine will not save you, only *obedience*. And this means so much, I must beg you to excuse me from entering into a discussion of it. But if I am expected to afford you, through this address, any clue to the art of prolonging life, then I have to say, obey the laws of sanitary science. They have the power to prolong our lives and to protect the lives of our children. There was a time when doctors alone were expected to know any thing about sanitation. Against their own interest in the matter of dollars and cents, they have worked hard to develop and spread abroad the knowledge of the laws of health, and the prevention of disease. All this knowledge is now given to the world. Books, pamphlets, addresses, have been printed and freely given almost without money and without price. If men who spend years in making money, would only spend a few hours in studying hygiene, they might, perhaps, live to enjoy what they have made. If books on sanitary laws, on rearing children, caring for the home, food, ventilation, dress, exercise and other sanitary topics

were in all our libraries, on our center tables, what boundless profit it would be to us all. Ten, twenty and a thousand fold it would return to the world. But now in conclusion, gentlemen,

"That life is long which answers life's great end."

"We live in deeds, not years, in thoughts not breaths,
In feelings, not in figures on a dial.
We should count time by heart throbs; he most lives
Who thinks most, feels the noblest, acts the best."

LOCAL BOARDS OF HEALTH AND HEALTH OFFICERS.

Aberdeen.....	J. W. Guthrie, M. D.
Ada.....	W. H. Morrow, Clerk.
Akron.....	A. A. Kohler, M. D.
Alliance.....	James Bates, M. D.
Amelia.....	W. B. Doan, M. D.
Ansonia.....	H. A. Snorf, M. D.
Antwerp.....	J. H. Bond.
Arcanum.....	J. K. Albright.
Archbold.....	J. R. Hoffmire.
Ashland.....	R. A. Davies.
Ashley.....	J. Harroun.
Ashtabula.....	A. W. Hopkins, M. D.
Ashville.....	J. W. Johnson.
Attica.....	A. W. Knight, M. D.
Bainbridge.....	(Vacancy).
Barnesville.....	W. W. Hanlon.
Batavia.....	(Vacancy).
Bedford.....	H. O. Courtney.
Bellaire.....	J. Park West, M. D.
Bellefontaine.....	C. W. Hefner, M. D.
Belleville.....	T. T. Austin, M. D.
Belle Center.....	S. J. Pollock, M. D.
Bellevue.....	John Earls.
Berea.....	T. C. Card, Secretary.
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Bettsville.....	H. M. Buckingham, M. D.
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Bloomville.....	J. W. Hoy, M. D.
Bluffton.....	J. R. Clark, M. D.
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Bridgeport.....	John W. Stuff.
Brookfield.....	W. E. Dunford.
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Cambridge.....	E. M. Stottlemire.
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Canal Dover.....	E. Armick.
Canal Fulton.....	E. Williams.
Canfield.....	A. W. Yeates.
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Cardington.....	Genoa Smith.
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Cleveland.....	G. C. Ashmun, M. D.
Clifton.....	Wm. Herbert Bell, M. D.
Clyde.....	Alex. Harnden.
Coalton.....	A. C. Messenger, M. D.
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Columbus Grove.....	W. H. Begg, M. D.
Columbiana.....	George Roninger.
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Crestline.....	G. R. Edwards, M. D.
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Dayton.....	J. M. Weaver, M. D.
Defiance.....	A. Berchtold, M. D.
De Graff.....	J. H. Brown, M. D.
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Delta.....	S. P. Bishop, M. D.
Dennison.....	S. L. McCurdy, M. D.
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Dunkirk.....	C. C. McLaughlin, M. D.
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East Liverpool.....	Wm. Gibbs.
East Palestine.....	A. L. Leicester, M. D.
Eaton.....	O. H. Jefferson.
Elmore.....	Edward Morgan.
Elmwood Place.....	E. J. Jones, M. D.
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Fairfield.....	G. H. Albright, M. D.
Fayette.....	E. J. Emrick.
Felicity.....	C. E. Houghton.
Findlay.....	Amos Beardsly.
Flushing.....	J. V. Webster, M. D.
Forest.....	W. N. Munday, M. D.
Fostoria.....	J. O. Hess.
Franklin.....	F. R. Evans, M. D.
Fredericksburg.....	L. C. Miller.
Fredericktown.....	P. W. Plemmer.
Fremont.....	F. S. Hillbish, M. D.
Galion.....	Webb J. Kelly, M. D.
Gallipolis.....	E. Westlake, M. D.
Gambier.....	Joe Wagner, M. D.
Garrettsville.....	L. L. Johnson, M. D.
Geneva.....	G. W. Foster, M. D.

Georgetown.....	A. M. Kautz.
Gibsonburg.....	W. M. Brown.
Glendale	R. D. Mussey, M. D.
Glenville.....	Chas. B. Cook, M. D.
Glouster.....	D. W. Collison, M. D.
Granville.....	John Watkins, M. D.
Greenwich.....	R. H. Reynolds, M. D.
Green Springs.....	D. P. Campbell, M. D.
Greenville.....	G. W. Burnett, M. D.
Hamden Junction.....	L. B. Smith, M. D.
Hamilton.....	Geo. Trebel, M. D.
Harmar.....	John W. Knox.
Hartwell.....	C. W. Tufts, M. D.
Hicksville.....	S. Blodgett.
Higginsport	P. J. Daum.
Hilliards	N. P. Davidson, M. D.
Hillsboro.....	H. M. Brown.
Hudson	F. Hodge, M. D.
Huron	J. P. Esch, M. D.
Ironton	N. K. Moxley, Jr., M. D.
Jackson.....	E. D. Meachem.
Jamestown.....	F. W. Ogan, M. D.
Jeffersonville.....	G. M. Ireland, M. D.
Johustown.....	Albert Dresbach.
Kent.....	J. P. Holcomb.
Kenton	L. Wells.
Lancaster	J. W. Lewis, M. D.
Larue.....	J. A. Houser, M. D.
Lebanon	J. B. Graham, M. D.
Leesburg	H. A. Beeson, M. D.
Leetonia.....	S. R. McCurdy, M. D.
Leipsic.....	John McClung, M. D.
Lima.....	J. J. Murphy, M. D.
Linwood.....	E. W. Wilkinson.
Lockland.....	R. B. Latta.
Logan.....	I. C. Wright, M. D.
London.....	M. M. Moffitt, M. D.
Lorain	S. S. Cox, M. D.
Louisville.....	F. E. Favret.
Loveland	J. M. Criley, M. D.
Lynchburg.....	T. W. Duvall, M. D.
Macksburg.....	J. H. Williams, M. D.
Madison	A. H. Stockham, M. D.
Madisonville.....	C. P. Gray, M. D.
McComb.....	John A. Thompson, M. D.
McConnellsville	J. E. Brown, M. D.
Mansfield.....	R. Harvey Reed, M. D.
Marietta.....	C. W. Eddy, M. D.
Martin's Ferry.....	W. H. Orr.
Marysville.....	John H. Shirk.
Massillon.....	T. Clarke Miller, M. D.
Mason	J. M. Van Dyke, M. D.
Marion.....	J. K. Redd.
Maumee.....	G. W. Rhonehouse, M. D.
Mechanicsburg	O. A. Nincehelter, M. D.

Mechanicstown	John M. Watt, M. D.
Medina	L. E. Tyler.
Monticello	J. W. Lowe, M. D.
Miamisburg	W. S. Bookwalter, M. D.
Middleburg	W. B. Hodge.
Middletown	Geo. D. Lummis, M. D.
Milford	Otto Palm, Sr., M. D.
Millersport	J. E. Whitmar, M. D.
Minerva	O. W. Kurtz.
Minster	R. A. Rulmann, M. D.
Monroeville	John T. Gill, M. D.
Moscow	J. R. Wiley.
Mt. Gilead	Geo. H. Hales.
Mt. Pleasant	J. A. McGlenn, M. D.
Mt. Victory	F. Humphreys, M. D.
Mt. Vernon	B. B. Scott, M. D.
Napoleon	T. C. Hunter, M. D.
Nashport	H. L. Curtis.
Navarre	P. B. Welch.
Nelsonville	Chas. W. Cable, M. D.
Nevada	W. L. Blair.
Newark	J. F. Mattingby, M. D.
New Bremen	M. S. Eckemyer, M. D.
New Carlisle	H. H. Young, M. D.
New Concord	W. S. Kline.
Newcomerstown	R. A. Goudy, M. D.
New Holland	W. S. Scurlock, M. D.
New Lexington	D. M. Rea.
New Lisbon	John Cavanagh.
New London	N. O. Allen, M. D.
New Matamoras	W. L. West, M. D.
New Paris	J. I. Robinson, M. D.
New Richmond	T. J. Mullen, M. D.
New Straitsville	Barney Davis.
New Vienna	R. T. Trimble, M. D.
New Washington	J. F. Kimerline.
Niles	F. Casper.
North Amherst	W. H. Cornwell, M. D.
North Baltimore	J. R. Archer, M. D.
North Lewisburg	Daniel Brown.
Oak Harbor	J. M. Stewart, M. D.
Oak Hill	D. B. Warren, M. D.
Oberlin	T. R. Mayhew.
Orrville	S. P. Grill, M. D.
Osborn	R. C. Hoover, M. D.
Ottawa	C. E. Beards'ey, M. D.
Oxford	H. D. Hinckley, M. D.
Painesville	S. D. Barber.
Pemberville	E. B. Morse.
Pioneer	W. H. Durbin.
Piqua	R. M. O'Ferrall, M. D.
Plain City	M. J. Jenkins, M. D.
Plymouth	R. D. Sykes, M. D.
Pomeroy	James Smith.

Port Washington.....	F. G. Helms.
Portsmouth.....	C. C. Fulton, M. D.
Quaker City.....	Barnard Eagon.
Ravenna.....	Joseph Gledhill.
Rawson.....	Howard Stallsmith.
Racine.....	Martin Adams.
Reading.....	F. X. Ankenbauer.
Richwood.....	J. Oatley, M. D.
Ripley.....	J. C. Winters, M. D.
Riverside.....	A. B. Blistain.
Rock Creek.....	J. C. Knowlton.
Rocky Ridge.....	A. Garriss.
Roseville.....	W. A. Melick, M. D.
Sabina.....	A. J. Gaskins, M. D.
St. Clairsville.....	D. L. Walker, M. D.
St. Mary's.....	W. B. Schonover, M. D.
St. Paris.....	C. A. Offenbacher, M. D.
Salem.....	T. T. Church, M. D.
St. Bernard.....	R. H. Whalton, M. D.
Sandusky.....	Elwood Stanley, M. D.
Savannah.....	L. S. Cowie.
Scott.....	C. H. Hasper, clerk.
Sedalia.....	E. B. Mead, M. D.
Seville.....	P. E. Beach, M. D.
Shawnee.....	C. E. Whittington, clerk.
Shelby.....	M. T. Love, M. D.
Sidney.....	Edwin LeFevre, M. D.
Smithville.....	J. W. Bricker, M. D.
South Charleston.....	M. H. Collins, M. D.
Springboro.....	David Mering.
Springfield.....	H. H. Seys, M. D.
Steubenville.....	A. A. Elliott, M. D.
Sunbury.....	J. H. Gerhardt, M. D.
Sylvania.....	T. T. Cosgrove, M. D.
Tiffin.....	J. Bridinger, M. D.
Toledo.....	G. C. Collamore, M. D.
Troy.....	J. G. Senour, M. D.
Uhrichsville.....	J. E. Groves, M. D.
Union City.....	W. M. Grimes, M. D.
Upper Sandusky.....	O. C. Stutz, M. D.
Urbana.....	H. C. Houston, M. D.
Utica.....	G. W. Garrison, M. D.
Van Wert.....	E. W. Wilkinson, M. D.
Versailles.....	W. H. Rike, M. D.
Wadsworth.....	T. M. Screene.
Wapakoneta.....	Jno. B. Mouch.
Warren.....	W. C. Hunt, M. D.
Washington C. H.....	J. M. Edwards, M. D.
Washingtonville.....	O. A. Rhoades.
Wauseon.....	L. E. Miley, M. D.
Waverly.....	Austin Hutt, M. D.
Waynesfield.....	
Wellington.....	D. R. Sheldon.
Wellston.....	G. W. Darling, M. D.
Wellsville.....	J. F. Davidson.

West Alexandria.....	L. J. Ashworth.
West Cleveland.....	G. T. Brooks.
Westerville.....	J. W. Oylar.
West Liberty.....	Ben. S. Leonard, M. D.
West Milton.....	Jno. W. Tuthill, M. D.
West Jefferson.....	W. E. Postle, M. D.
West Unity.....	J. H. Fiddler.
Whetstone.....	A. A. Nefe, M. D.
Whitehouse.....	F. M. Heath, M. D.
Williamsport.....	G. O. Hayes, M. D.
Willshire.....	S. K. Christy, M. D.
Wilmington.....	G. M. Austin, M. D.
Winchester.....	C. W. Salisbury, M. D.
Woodsfield.....	W. J. Grimes, M. D.
Woodville.....	Henry Busch, M. D.
Wooster.....	J. E. Barrett, M. D.
Xenia.....	A. D. De Haven, M. D.
Youngstown.....	H. L. Buecher, M. D.
Zanesville.....	H. T. Sutton, M. D.

FINANCIAL STATEMENT.

Appropriation for the year 1890..... \$4,700 00

Expenditures for the year ending October 31, 1890 :

Printing and stationery..	\$904 10
Postage.....	327 23
Books and journals..	124 89
Salaries	2,400 00
Expenses of members.....	623 95
Traveling expenses of Secretary.....	299 88
Messenger	120 00
Express	122 93
Telegrams	36 66
Chemical analyses	115 00
Type writer.....	125 00
Post-office box rent.....	8 00
St-nographer	25 00
Clerk hire.....	13 00
Vaccine virus.....	21 15
Ozone paper.....	17 50
Telephone.....	15 00
Office supplies.....	49 29
Repairs	7 00
Miscellaneous.....	80 03
	\$5,435 61

A COMPLETE LIST AND SHORT DESCRIPTIVE HISTORY OF ALL WATER-WORKS IN OHIO.

[Taken from Manual of American Water-Works Company for 1890.]

AKRON.—History—Built in '80-1 by Akron Water-Works Co. under perpetual charter.

Water Supply—Well in gravel, pumping to reservoir. The well of brick, 50 feet in diam., 32 ft. deep, with walls from 30 to 18 ins. thick, sunk on c. i. shoe by excavating from inside and letting their weight carry them down.

Pumping Machinery—Dy. cap., 5,000,000 galls.

Force Main—Originally 2,500 ft. of 16-in. c. i.

Reservoir—Cap., est., 3,500,000 galls.; 200x250 ft., x15 ft. deep; in excavation and embankment, lined with 18 ins. of puddle, on which is paving of sandstone blocks in cement.

Distribution—Mains, c. i., 27 miles. Services, galv. i. Taps, 1,643. Meters, 65. Hydrants, 197.

Consumption, 1,500,000 galls. Pressure, 60 to 90 lbs.

Financial—(In '87.) Cost, \$250,000. Cap. stock, \$250,000. Bonded debt, \$200,000, Int., 6%. Ann. op. exp., \$8,000. Ann. rev.: consumers, \$8,000; city, \$9,500. Hydrant rental, \$45.

ALLIANCE.—History—Built in '83 by Alliance Water-Works Co.

Water Supply—Mahoning river, pumping to stand-pipe and direct.

Dam—Of squared timber cribs, filled in with stone, forming pool from which water is pumped.

Pumping machinery—Dy. cap., 3,000,000 galls.

Stand-Pipe—Cap., 188,000 galls.; 20x80 ft.

Distribution—(In '87.) Mains, c. i., 6 miles. Services, galv. i. Taps, 271. Meters, 25. Hydrants, 55.

Consumption (in '87), 193,291 galls. Pressure, ordinary, 73 lbs. Fire, 100 to 140 lbs.

Financial—(In '87.) Cost, \$145,000. Cap. stock, \$75,000. Bonded debt, \$70,000. Int., 6%. Ann. op. exp., withheld. Ann. rev.: consumers, withheld, city, \$3,360. Hydrant rental, \$60.

ASHTABULA.—History—Built in '87 by Ashtabula Water Supply Co., under 20 years franchise. Also supplies Ashtabula Harbor.

Water Supply—Series of wells and galleries on sandy shore of Lake Erie, pumping to stand-pipe.

Pumping Machinery—Dy. cap., 3,000,000 galls.

Reservoir—Cap., 10,000,000 galls.

Stand-Pipe—Cap., 235,000 galls.; 20x100 ft.

Distribution—Mains, c. i., 14 miles. Services, lead, iron. Taps, 867. Meters, 75. Hydrants, 100.

Consumption, not given. Pressure, 75 lbs.

Financial—Cost, \$320,000. Cap. stock, \$250,000. Bonds, \$20,000. Sinking fund, \$5,000 per annum after 10 years. Int., 6%. Ann. op. exp., withheld, est., \$3,500. Ann. rev.: consumers, including railways, \$1,700; city, \$4,500. Hydrant rental, \$45.

ATHENS ASYLUM FOR THE INSANE.—(Pop., 900.) At Athens, on Hocking river.

History—Built in '73-4 by asylum.

Water Supply—Well, pumping, to reservoir. Well is 26 ft. in diam., 20 ft. deep, in gravel, 600 feet from Hocking river.

Pumping Machinery—Dy. cap., 1,000,000 galls.

Reservoir—Cap., about 400,000 galls.; 50x150 ft.x6 ft. deep; in excavation and embankment, 150 ft. above pumps, 100 above asylum.

Distribution—Mains, w. i., 1½ miles. Services, c. i. Taps, not given. Meters, none. Hydrants, 5.

Consumption, 125,000 galls. Pressure, 35 lbs.

Financial—Cost, unknown. No debt or revenue. Am. op. exp., not given.

AVONDALE.—General Description—Pipe laid in '87, and owned by village. City of Cincinnati furnishes water from its tank on Mount Auburn, controls system, collects all rates, and after 20 years, or earlier, is to own distribution system to the amount of \$75,000, provided, that 50% of revenue derived from same be returned to village for that purpose.

BELLAIRE.—History—Built in '72 by city.

Water Supply—Ohio river, pumping to reservoir.

Pumping Machinery—Dy. cap., 5,000,000 galls.

Reservoir—Cap., 3,000,000 galls.; semi-circular, 190x95 ft.; one mile from, 216 ft. above, pumps, 165 ft. above main part of city. Has puddled banks and 4-in. brick lining.

Consumption, 3,000,000 galls. Pressure, 65 lbs.

Distribution—Mains, c. i., Wykoff wood, 10 miles. Services, lead. Taps, 2,500. Meters, 6. Hydrants, 82.

Financial—Cost, \$164,443. Debt, \$130,000. Int., 6%. Ann. op. exp., \$11,000. Ann. rev.: consumers, \$18,000.

BELLEFONTAINE.—History—Built in '83 by town.

Water Supply—Old: springs, by gravity. New: two 8-in. flowing wells, by pumping. Wells, 140 ft. deep, 50 ft. in rock.

Pumping machinery—Dy. cap., 1,500,000 galls.; two 750,000, added in '89.

More's Hill Dam and Reservoir—Cap., 9,000,000 galls.; area, 1 acre. Dam of clay, with heart-wall; 250 ft. long, 23 ft. high, 21 ft. water; 12 ft. wide on top, 100 at bottom. Inner slope paved with 12-in. cobbles; outer, unpaved. Heart-wall: brick in cem., 2 ft. thick, extending down 6 ft. from top of spillway. Spill-way: in center of dam, 30 ft. long, 2 ft. deep, lined with masonry, free; slope, 1½ to 1. Discharge-pipe: 16-in. Dam does not leak. Built in '83. Cost, \$8,000.

Distribution—Mains, c. i., 7½ miles. Services, w. i., lead. Taps, 175. Meters, 3. Hydrants, 72.

Consumption, 500,000 galls. Pressure, 60 lbs.

Financial—Cost, \$80,000. Bonded debt, \$80,000. Int., 6%. Ann. op. exp. (in '87), \$800. Ann. rev., \$2,000. Extensions in '89 cost \$20,000.

BELLEVUE.—History—Built in '73 by city.

Water Supply—Surface water, collected in reservoir by ditch draining large area of prairie, then pumped to stand-pipe.

Reservoir—Cap., 100,000,000 galls.; area, 12 acres; in excavation and embankment, on same level as city. Banks of natural earth, 20 ft. high, 8 ft. wide on top, unpaved.

Culvert: diam., 3 ft. Discharge-pipes, two, 10-in. Does not leak. Built in '71 and '81. Cost, \$40,000.

Pumping Machinery—Dy. cap., 1,100,000 galls. Contracts let in '89 for 2,000,000 Gordon.

Stand-Pipes—Old: no data. New.: cap., 235,000 galls.; 20x100 ft.; projected in '89.

Distribution—Mains, Wyckoff wood, 3 miles. Services, w. i. Taps, 186. Meters, none. Hydrants, 23.

Consumption, 500,000 galls. Pressure, 18 lbs.

Financial—Cost, \$38,000. Debt, \$36,000. Int., 5%. Ann. op. exp., \$1,800. Ann. rev.: consumers, \$2,500, of which \$1,450 is from railways.

BROOKLYN.—History—Built in '88 by village.

Water Supply—Cleveland Water-Works, through meter.

Distribution—Mains, 4 to 8-in. c. i., 7 miles. Services, lead. Taps, 200. Meters, 47. Hydrants, 59.

Consumption and pressure, not given.

Financial—Cost, \$35,000. Debt, \$29,000. Int., 6%. Other data not determined.

BUYRUS.—History—Built in '83-4 by private company under 30 years, franchise.

Water Supply—Well, filtered, by direct pumping. Well is 50 ft. in diam., 20 ft. deep, walled with cut stone.

Pumping Machinery—Dy. cap., 2,000,000 galls. Contract let in '89 for 1,500,000 Gaskill horizontal crank.

Filters—Dy. cap., 650,000 galls.; Hyatt, erected Feb., '87.

Distribution—Mains, Wyckoff; 12 miles. Services, lead, i., Wyckoff. Taps, 325. Meters, none. Hydrants, 101 public and 1 private.

Consumption, 265,000 galls. Pressure: Ordinary, 40 lbs. Fire, 80 lbs.

Financial—Cost, \$108,000. Cap. stock, \$20,000. Bonded debt, \$99,000. Int. 6%. Ann. op. exp., \$4,200. Ann. rev.: consumers, \$4,000; city, \$5,140. Hydrant rental, \$55.71 for first 70, and \$40 for each additional.

CANTON.—History—Built in '69 by city.

Water Supply—Myers' lake, Nimishillen creek, and wells, by direct pumping. First supply was from lake, which is $2\frac{1}{2}$ miles from city. This becoming inadequate, water was taken from creek. In '89, 5 or more wells were drilled in sandstone to av. depth of 300 feet.

Lake has area of 150 acres, and drainage area of about 13 sq. m. Creek rises five miles above pumping station, and drains gravelly country.

Conduit—Extends from lake to pumps, $1\frac{1}{2}$ miles of 24-in. earthenware pipe.

Pumping Machinery—Dy. cap., 5,500,000 galls.; 2,000,000 and 3,000,000 comp., dup. Manufacturers report, 5,000,000 Worthington, 2,000,000 Holly.

Distribution—Mains, c. i., w. i., 30 miles. Services, galv. i. Taps, 1,700. Meters, 3. Hydrants, 232, including 13 private.

Consumption, 1,100,000 galls. Pressure, ordinary, 60 lbs. Fire, 100 lbs.

Financial—Cost, about \$300,000. Bonded debt, \$140,000. Int., 5%. Ann. op. exp., about \$8,000. Ann. rev., \$16,000.

CHILLICOTHE.—History—Built in '81-2 by Chillicothe Gaslight & Water Co.

Water Supply—Well on bank of Scioto river, pumping to reservoir.

Pumping Machinery—Dy. cap., 3,500,000 galls.

Reservoir—Cap. 3,500,000 galls.

Distribution—Mains, c. i., 22 miles. Services, galv. i., lead. Taps, 800. Meters, 20. Hydrants, 115.

Consumption, 700,000 galls. Pressure, 95 lbs.

Financial—Cost, \$250,000. Cap. stock, debt, int. withheld. Ann. op. exp., withheld est. \$4,000. Ann. rev.: consumers, withheld, est., \$18,000; city about \$6,900. Hydrant, rental, \$60.

CINCINNATI.—History—Built in '20 by Saml. W. Davis, who organized Cincinnati Water Co. in '26. Bought by city, June 15, '39, and extended by it from time to time since. Suburban villages of Avondale and Clifton own 17 miles of pipe, and are supplied from Cincinnati. City controls their supply and collects all rev., and in 20 years or earlier is to own pipe in Avondale to amount of \$75,000, and in Clifton to amount of \$25,000, provided one-half of all revenues collected are refunded for the purpose.

When works were built in '20 the population was 9,642. Cap. stock of company at time of its organization was \$75,000. When city purchased works there had been laid 22.3 miles of wooden logs, with a bore from $1\frac{1}{2}$ to $2\frac{1}{2}$ in., and nearly 4 miles of iron pipe mostly 3 and 4 in. in diam. All mains laid since then have been of c. i.

Water Supply—Ohio river, pumping to reservoirs for low and middle service and pumping to tank for high service. Drainage area above Cincinnati, about 77,000 sq. m., of which 8,000 sq. m. near city furnishes water containing salts of lime.

Hardness of supply varies with amount furnished by limestone basin. Supply is subject to contamination, water being taken from river about $\frac{3}{4}$ miles from center of city, and 5 miles from its upper limits. For a time the eddy from Deer creek canal caused much pollution, but this was temporarily stopped by sinking barges, and permanently by extending the intake pipes and changing the shore line.

Supply introduced by Saml. W. Davis in '20 was pumped by horse-power from river to tank, and then repumped by horse-power to a wooden distributing reservoir.

Intake-pipes and Aqueducts—In '81 water was taken from river near channel, about 100 ft. from river front of pump house, and conducted through iron pipes and stone aqueducts to pump-wells. In low water principal supply was furnished to pumps through two 40-in. pipes. These were laid on bed of river, extending 40 ft. from stone walls forming outer limits of aqueduct.

There are two aqueducts, one 5, and other 20 ft. wide. In large aqueduct a 60 in. w. i. pipe was laid for an independent supply to large engine, but owing to irregular operation, the pipe became packed with river deposit. Height of river varies 60 ft. and the suction pipes of pumps are placed below low water.

Pumping Machinery—Dy. cap., 73,000,000 galls.

General Description of Reservoirs—First was of wood, built in '20. In '51, city built a low service reservoir, and '66 it began Eden Park middle service reservoir finishing upper basin in '75 and the lower in '78.

Low Service Reservoir—Cap. 5,000,000 galls.; on Third street, 750 ft. from engine house and 165 ft. above it; rectangular, in two divisions, has dressed stone walls, and is entirely above surface of ground. Its flow-line is 170 ft. above low water in river; lowest point supplied is about 60, and highest 100 ft. above low water. In '81 about one-third of water consumed was supplied from this reservoir.

Eden Park Middle Service Reservoir—Cap., 100,000,000 galls. In deep, rapidly descending ravine; is formed by retaining wall or dam, and divided by wall into upper basin of 57,000,000, and lower of basin of 43,000,000 galls. cap. Flow-line of this reservoir is 232 ft. above low water in river; lowest point supplied is 60, and highest 180 ft. above low water. Two 35-in. supply mains led from reservoir in '81, and high service supply is repumped from here.

Dam is 119 ft. high, $48\frac{1}{2}$ ft. wide at its base, 25.8 ft. at bottom of the reservoir, and 22 ft. at top; extreme length, 1,251 ft. Eight elliptical arches, 55 ft. long with 18-ft. rise, are constructed along outer face of dam to support part of a roadway. Arches, copings, and pilasters are finished with dressed Dayton stone.

Southwestern part of lower basin is of filled ground, 85 ft. in depth. Division wall is 30 ft. wide at base, 10 at top and 400 ft. long, including effluent and influent chambers former being at west and latter at east end.

Effluent pipes: laid in tunnel, 12 x 1,100 ft., of four courses of brick in cement, costing \$73,000. Reservoir cost \$1,660,000.

High Service Tanks—Cap. 1,400,000 galls., two; each is 60 x 38 ft., of plates 50 x 144 ins., from 11-64 to 7-16 in. thick; vertical joints are double riveted, and bottom plates are $\frac{1}{4}$ in. thick. These receive water that is repumped from Eden Park reservoir for supplying higher districts. First tank was built in '69 on Mt. Auburn, and in '70 a second one was built for the same service.

In '81 another tank was completed on Price's Hill. It was 100 x 40 ft., placed on solid masonry foundation; steel, $\frac{1}{2}$ -in. thick at bottom, $\frac{1}{4}$ -in. at top. When nearly full, for first time, tank gave way at bottom and was ruined. It is said that construction was not in accordance with specifications. It was designed by Jas. E. Bell, then Supt., and the Contrs. were Geo. Stacey & Co., Cincinnati. It is not stated whether this tank has been rebuilt.

Distribution—Mains, c. i., 264 miles. Services, lead. Taps, 33,082. Meters, 1,304; first used in '60. Hydrants, number not given. Close of '60: Mains, 83.66 miles. Taps, 12,600. Meters, 36. Close of '70: Mains, 133.08 miles. Taps, 18,629. Meters, 127. Close of '80: Mains, 188.86 miles. Taps, 23,627. Meters, 545.

Consumption, 32,271,426 galls. Pressure, extremely variable; not relied upon for fire protection.

Financial—Cost, \$7,847,495. Debt, \$1,225,000. Int., 6, 7, and 7 3-10%. Ann. op. exp., \$300,177. Ann. rev.: consumers, \$662,092. Hydrant rental, in Avondale, \$50 per mile. Cost, close of '60, \$2,250,000; do., '70, \$4,445,434; do., '80, \$6,727,838. Rev., '60, \$169,713; do., '70, \$380,812; do., '80, \$499,857.

CIRCLEVILLE.—History—Built in '86-7 by Circleville Water Supply Co., under 20-years franchise.

Water Supply—Darby creek, pumping from filter gallery on shore to stand-pipe.

Storage Reservoir—Cap., 14,000,000 galls.

Filter Gall-ry—No data.

Pumping Machinery—Dy. cap., 3,000,000 galls.

Distribution—Mains, 16 to 6 in. c. i., 12 miles. Services, w. i., lead. Taps, 250. Meters, not given. Hydrants, 102.

Consumption, not given. Pressure, 70 to 100 lbs.

Financial—Cost, \$180,000. Cap. stock, \$150,000. Bonded debt, \$150,000. Int., 6%. Ann. op. exp., about \$3,000. Ann. rev.: consumers, \$4,100; city, \$3,500. Hydrant rental, \$35.

CLEVELAND.—History—Built in '54-6 by city, when pop. was about 25,000. The building of the first system took from '53 to '58, a temporary intake being used meanwhile. From '69 to '74 important extensions were made, including a lake tunnel, and in '88 contracts were let for a new and larger tunnel.

Cleveland Water Co. was organized in '33, had its privileges extended, and its cap. stock increased to \$200,000 in '50, but never did any work.

Village of West Cleveland is supplied from these works through two meters being treated as a single customer. See West Cleveland.

Water supply—Lake Erie pumping to reservoirs.

Intake Crib—of 12 in. white pine, 61 ft. high, pentagonal, each outer side measuring 54, each inner, 19 ft. Midway between two walls is a second wall. Both sides of each wall are covered with 2 in. oak plank, the 2 walls are tied together and braced, and each wall has drift bolts running through the courses of timber. Spaces between middle, inner and outer walls are filled with stone to under side of floor or deck, which is 12 ft. above lake surface, except that for 5 ft. below low water space between middle and inner wall was filled with concrete, which serves as a foundation for a stone superstruct-

ure built on the crib in '78. About 400 cords of stone were placed around the crib. Before the crib was completed it had settled 14 ft. into clay, but has stood well since.

Water is admitted to well-hole of crib through two large openings near bottom of lake, each large enough to supply water to full cap. of the tunnel. From these openings gate wells extend to top of crib. For 5 ft. down from a little above high water outside of crib is plated on 3 exposed sides with $\frac{1}{2}$ in. boiler iron, and on two shore sides with $\frac{3}{8}$ in. This was done to prevent thin ice from cutting timber, as during first winter grooves 1 in. deep were cut in this way. Contrs., D. D. & A. H. D. Delameter.

Tunnel—Length, lake to shore shaft, following curves, 6,661.6 ft.; in straight line 6,006 ft.; diam., 5 ft.

Extended in '75 from shore, 2,580 ft. to pump-wells, new part having diameters of 5 $\frac{1}{2}$ and 6 ft.; bottom is 10 ins. lower than main tunnel at shore end, and 74 ft. below surface of old River St. Previous to this old aqueduct had been used.

Internal diam. of shafts, 8 ft.; depth below water surface, lake shaft, 90.2 ft., shore, 67 $\frac{1}{2}$ ft. Inlet shaft from floor of crib to the top of tunnel is of iron, 46 ft. of lower portion being of 2 in. c. i., put together in 6 sections, each 7 ft. 8 ins. long. Four upper sections are of $\frac{3}{4}$ in. boiler iron, with c. i. flanges. All of sections are bolted together. When water was admitted two of upper sections were removed, water flowing in over top, 9 ft. below surface, thus giving greater intake area than would have been secured by using gates at the sides. This tends to prevent the accumulation of anchor ice about the inlet.

Tunnel and extension driven through unstratified blue clay, some portions being dry and hard, others moist and soft. In this were stone varying in size from 4 cu. ft. to gravel. Distance from lake surface to rock under the clay is 80 ft. at the shore shaft, and 117 ft. at the crib. Rock is a soft, light-colored shale.

New Tunnel—From inlet crib to main pumping station, 7 ft. in diam., 9,200 ft. long; est. dy. cap., 110,000,000 galls., giving head of 13 $\frac{1}{2}$ ft. on the suction pipes. Contract was let, Mar. 24, '88, to I. S. Casement, Painesville, O., for \$204,301; will be finished in '90. Capacity of two tunnels will be 150,000,000 galls.

Foundations of Pumping Station—On quicksand, there being two courses of 12 in. timbers, 1 ft. apart, with spaces filled with concrete. On this a flooring of large stones was laid, then inverted arches built to support walls of engine foundation and pump-well. Timbers extend beneath whole station, and under stand-pipe.

Pumping Machinery—Dy. cap. 70,000,000 galls.

Stand-Pipe—At engine house, 36x148 ft.

Force Mains—First was 24 ins. in diam., 2,200 ft. long, leading to old reservoir. With new engines new mains were added, and for supply east of river there are now one 16, one 20, two 30 in. mains, while a 30-in. main supplies part of the city west of river, crossing being by 3 w. i. pipes, one 36, two 33 ins. in diam. All are $\frac{1}{2}$ in. thick, double riveted, from 220 to 270 ft. long, dipping by easy curves 25 ft. below water surface and lying in trenches. Between two reservoirs, 30 in., 13,000 ft. long.

Old Reservoir—Cap. 6,000,000 galls.; in embankment 21 ft. high, lined with 2 ft. of puddle, paved with brick in cem.

Fairmount Low Service Reservoir—Cap., 80,000,000 galls.; two distinct basins conforming to topography, one holding 47,000,000, one 33,000,000 galls. Head of water is 170 ft. above Lake Erie. Land for this reservoir was bought in '82. Banks of loamy sand, on shale rock without heart-wall; 25 ft. high, 16 ft. wide, on top. Inner slopes, 1 $\frac{3}{4}$ to 1, with 10 in. sandstone paving on 6 ins. of broken stone; outer, 2 to 1, sodded. Bottom covered with 12 ins. concrete on 30 ins. puddled clay. Discharge pipes: four; 30 and two 36 in. supply, 24 in. waste-pipe. Does not leak. Cost, \$398,830.

High Service Reservoir—Cap., about 38,000,000 galls.; area 20 acres at base; depth, 20 ft.; is 325 ft. above Lake Erie, filled from Fairmount reservoir. Old Cornish engines were removed from main to high-service station. About a year after its completion water

was drawn out to within 2 feet of bottom. There was considerable ice in reservoir, and this together with drawing out of the water, caused banks and pavings to slide in, damaging a quarter of the paving, or less. Embankments were of clay, and it is claimed they had not fully settled.

Distribution—Mains, c. i. 275½ miles. Services, galv. i., lead. Taps, 27,516. Meters, 1,644. Hydrants, 2,894. Close of '60: Mains, 25½ miles. Taps, 1,000. Meters, none. Hydrants, 138. Close of '70: Mains, 56½ miles. Taps, 3,227. Meters, no record. Hydrants, 256. Close of '80: Mains, 115 miles. Taps, 11,564. Meters, 444. Hydrants, 998.

Consumption, 23,199,700 galls. Pressure 12 to 70 lbs.

Financial—Cost, \$5,371,878. Debt, \$1,775,000: \$600,000 at 7, \$975,000 at 6, \$100,000 at 4, \$100,000 at 3.65 %. Ann. opp. exp., \$96,047. Ann. rev.: \$401,775. Cost, close of '60, \$518,732; do., '70, \$798,244; do., '80, \$2,640,829. Rev., '60, \$16,794; do., '70, \$62,870; do., '80, \$202,758.

CLIFTON.—General Description—Supplied from Cincinnati water-works in '86. Village owns pipe, but contract with city provides for entire control of works and collection of revenue; pipe system to be owned by city after 20 years, or earlier, to amount of \$25,000, provided one-half of all rev. collected by city be returned to village, semi-annually, for that purpose.

CLYDE.—History—Built in '83-4 by city. In '86 pipe system was extended and settling reservoir built.

Water Supply—Wells in settling reservoir, direct pumping; emergency supply from storage reservoir on Raccoon creek. Original supply from 3 flowing wells in bottom of settling reservoir. Oct. '88, well 13 ft. in diam., 30 ft. deep, was sunk in the bottom of settling reservoir; 3 6 in. holes were drilled in bottom, through rock. Pumps now draw directly from this well.

Storage Reservoir—Cap. not given; on creek, largely of natural formation.

Settling Basin—Built in '86. Three flowing wells in bottom.

Pumping Machinery—Dy. cap., 2,000,000 galls.

Distribution—Mains, c. i., 4½ miles. Services, galv. i. Traps, 194. Meters, none. Hydrants, 38.

Consumption 50,000 galls. Pressure: ordinary, 25 lbs. Fire, 100 lbs.

Financial—Original cost, \$25,000; cost to date, not determined. Bonded debt, \$26,000. Int., 6%. Ann. op. ex., \$1,688. Ann. rev., \$1,300.

COLUMBUS.—History—Built in '70 by city when pop. was 31,274; previous supply from wells.

Water Supply—Ground water from filter galleries near Olentangy and Scioto rivers, by direct pumping. In '89 contract for sinking well 31 ft. in diam., 55 ft. deep was awarded to Free & Meredith, Pittsburgh, Pa.; price, \$16,220.

Filtering Basins and Galleries.—First supply was from well on bank of Olentangy river, tributary of Scioto. In 73-4 filtering basins were built close to Olentangy river, and conduit built between these and old well. Lower basin was excavated to 27 ft. below ground, or 13 below river surface; slopes, 1 to 1, protected by rip-rap; bottom area, of 14,994 sq. ft. Its supply was from ground water and upper basin; latter had surface area of 8,742 sq. ft., and was excavated 7 ft. below river.

On river side of upper basin, 7 ft. below surface, gallery 18 x 21 ins. was built, emptying into lower basin. From it 14 smaller galleries extended under upper basin, bottom of which was covered with graduated gravel and sand, coarsest gravel being at bottom, with 7 ins. of fine sand at top. A 12-inch pipe admitted water from river to this basin, covering sand with 2½ ft. of water at low stages of river. Filter was too small, receiving 1,000,000 galls., of which it filtered but one-half.

In '77-9 natural filter gallery was extended along river bank from pumps. Conduit is elliptical, 36 x 42 ins. of specially molded arch brick, each alternate course in lower

half having openings to admit ground water, where conduit passes through good gravel. Conduit is generally 23 ft. below surface, or 10 ft. below low water in river. It was constructed in open cut, through strata of alluvial deposit, quicksand and gravel. It is 5,715 ft. long, passing beneath Olentangy river and terminating at bend in Scioto, where well with gates and inlet pipes allows water to be drawn from river, if necessary.

In '85 gallery was extended.

Pumping Machinery—Dy. cap. 33,000,000 galls.

Scioto River Crossing—By 10-in. w. i. pipe, 426 ft. long, having ball and socket joints. In '73 an ice gorge broke pipe in middle section, and whole length was relaid in a trench 30 ins. deep, dredged in river bottom.

Distribution—Mains, c. i., w. i., 90.1 miles. Services, galv. i. Taps, 6,050. Meters, 503. Hydrants, 710. Close of '71: Mains, 6.2 miles. Taps, 42. Meters, none. Hydrants, 30. Close of '80: Mains, 39½ miles. Taps, 2,145. Meters, 534. Hydrants, 319.

Consumption, 6,188,708 galls. Pressure, ordinary, 70 lbs. Fire, 120 lbs.

Financial—Cost, \$1,856,780. Debt, \$894,908; \$594,908 at 6, \$300,000 at 4%. Ann. op. exp., \$33,189. Ann. rev.: consumers, \$128,518. Cost, close of '71, \$189,665; do., '80, \$700,359. Rev., '71, \$201; do., '80, \$48,228.

CRESTLINE.—History—Built in '69-70 by the city.

Water Supply—Springs, by gravity from collecting reservoir.

Reservoir—Cap., about 1,500,000 galls.; earth and stone, 120x280 ft., x5½ ft. deep. 127 ft. above city. Inner slope, 1½ to 1. Outer 2 to 1. Discharge-pipe; 10-in. Does not leak. Built in '71. Cost \$5,000.

Distribution—Mains, Wyckoff, 9 miles. Services, galv. i. Taps, 170. Meters, 1 Hydrants, 36.

Consumption, 50,000 galls. Pressure, 52 lbs.

Financial—Cost, 100,000. Debt, 15,000. Int., 5%. Ann. op. exp., \$1,000. Ann. rev.: consumers, \$2,200.

CUYAHOGA FALLS.—General Description—Fire protection secured by about one mile of pipe and 15 hydrants; pumps at three of the manufactories connect with river and mains.

NOTE—In the early part of '90 effort was being made to raise \$15,000, by bonds for more extended works.

DAYTON.—History—Built in '69-70 by the city.

Water Supply—From 30 8-in. tube wells, by direct pumping, water flowing to well near pump house. Av. depth of wells, 40 ft.; on both sides of Mad river, connected to 20-in. pipe crossing river.

Pumping Machinery—Dy. cap. 17,000,000 galls.

Distribution—Mains, c. i., 50 miles. Services, lead. Taps, 2,005. Meters, 126. Hydrants, 480. Close of '70: Mains, 22 miles. Taps, 462. Meters, none. Hydrants, 198. Close of '80: Mains 30½ miles. Taps, 1,211. Meters, 18. Hydrants, 286.

Consumption, 1,988,000 galls. Pressure: Ordinary, 50 lbs. Fire, 120 lbs.

Financial—Cost, \$1,064,469. Bonded debt, \$647,000: \$42,000 at 6, \$50,000 at 4½, \$555,000 at 4%. Ann. op. exp., \$24,000. Ann. rev.: consumers, \$32,629. Cost, close of '70, \$324,450; do., '80, \$705,918. Rev., '70, \$3,149; do., '80, \$18,277.

DEFIANCE.—History—Built in '87-88 by Defiance Water Co., under a 30-years franchise.

Water Supply—Maumee river, pumping to stand-pipe.

Pumping Machinery—Dy. cap., 5,000,000 galls.

Stand-Pipe—Cap., 398,000 galls.; 22x140 ft.

Distribution—Mains, c. i., 13 miles. Services, w. i., lead. Taps, 275. Meters, none. Hydrants, 139.

Consumption, 225,000 galls. Pressure, not given.

Financial—Cost, \$175,000. Cap. stock, \$200,000. Bonds, \$200,000. Int., 6%. Ann. op. exp., withheld, est., \$3,000. Ann. rev.: consumers, \$3,000; city, \$5,515. Hydrant rental, \$40.

DELAWARE.—History—Built in '88-9 by Delaware Water Co.; controlled by Moffett, Hodgkins & Clark, Watertown, N. Y.

Water Supply—Wells and springs, pumping to stand-pipe and direct.

Pumping Machinery—Dy. cap., 4,000,000 galls.

Stand-Pipe—Cap., 235,000 galls.; 20x100 ft.

Distribution—Mains, c. i., 18 miles. Hydrants, 206. Other data not determined.

Financial—Cost, \$200,000. Debt, \$180,000. Int., 6%. Ann. op. exp., and rev. not determined. Hydrant rental, about \$38.

DENNISON AND UHRICHVILLE.—History—Built in '88 by Dennison Water Supply Co., under 15 years franchise.

Water Supply—Big Stillwater creek, through filter gallery to receiving well, thence by pumping to reservoir.

Filter Gallery and Receiving Well—Gallery 190 ft. long, ending in well, 25 ft. in diam., 24 ft. deep.

Pumping Machinery—Dy. cap., 3,000,000 galls.

Force Main—C. i. 12 in., 2,800 ft. long.

Reservoir—Cap., 3,000,000 galls.; sides lined with brick.

Distribution—Mains, 14 to 6-in. c. i., 10 $\frac{3}{4}$ miles. Services, lead. Taps, number not given. Hydrants, 103.

Consumption, 600,000 galls. Pressure, 80 lbs.

Financial—Cost, \$300,000. Cap. stock, \$125,000. Bonded debt, \$125,000. Int., 6%. Ann. op. exp., \$1,500. Ann. rev.: consumers, \$5,400; city, \$3,700. Hydrant rental, \$40.

EAST LIVERPOOL.—History—Built in '79 by village.

Water Supply—Ohio river, pumping to reservoir, and direct if desired.

Pumping Machinery—Dy. cap., 1,500,000 galls.

Reservoir—Cap., 2,500,000 galls.; 266 ft. above city.

Distribution—Mains, c. i., 16 miles. Services, lead. Taps (in '82), 700. Meters, 12. Hydrants, 75.

Consumption, 1,000,000 galls. Pressure, ordinary, 110 lbs. Fire, 160 lbs.

Financial—Cost, \$51,000. Debt, \$25,000. Ann. op. exp., \$5,000. Ann. rev.: consumers, \$15,000.

EAST PALESTINE.—History—Built in '89-90 by village.

Water Supply—Four drilled wells, pumping through distribution to reservoir. Water in wells rises near surface.

Pumping Machinery—Dy. cap., 750,000 galls.

Reservoir—Cap., 300,000 galls.; 50 ft. in diam., 21 ft. deep; lined with fire-brick in cement. Has octagonal roof, ventilated.

Distribution—Mains, 10 to 4-in. c. i., 3.74 miles. Hydrants, 36.

Pressure, 96 lbs.

Financial—Cost, exclusive of real estate, \$23,500. Bonded debt, \$25,000. Int., 5%.

ELYRIA.—History—Built in '79 by Elyria Gas & Water Co.

Water Supply—Black river, pumping to tank.

Pumping Machinery—Dy. cap., 2,500,000 galls.

Tank—Cap., 135,000 galls.; 34x20 ft.

Distribution—Mains, c. i., 11 miles. Services, galv. i., lead. Taps, 405. Meters, none. Hydrants, 61.

Consumption, 600,000 galls. Pressure, ordinary, 34 lbs. Fire, 100 lbs.

Financial—Cost, \$160,000. Cap. stock, \$100,000. Bonded debt, \$75,000. Int., 7%. Ann. op. exp., \$3,881. Ann. rev.: consumers, \$6,300; city, \$5,350. Hydrant rental, \$85.

FINDLAY.—History—Built in '88-9 by city.

Water Supply—Blanchard river, pumping direct.

Dam and Storage Reservoir—Cap., 86,000,000 galls. Dam of masonry.

Pumping Machinery—Dy. cap., 5,000,000 galls.

Distribution—Mains, 20 to 4-in. c. i., 18 miles. Taps and Meters, not determined. Hydrants, 139.

Financial—Cost, \$275,000. Bonded debt, \$300,000. Int., 5%. Ann. op. exp. and rev., not determined.

FOSTORIA.—History—Construction begun Jan. 12, to be finished Oct. 1, '90, by city.

Water Supply—Surface water, pumping from reservoirs to stand-pipe. Drainage, area, 17 sq. m.

Reservoirs—Cap. 125,000,000 galls.; 110,000,000 and 15,000,000.

Pumping Machinery—Dy. cap., 3,000,000 galls.

Stand-Pipe—Cap., 367,000 galls.; 25x100 ft.; on masonry tower 53 ft. high.

Distribution—Mains, 14 to 4-in. c. i., 16 miles. Hydrants, 135.

Pressure, ordinary, 50 to 65 lbs. Fire, all department can handle.

Financial—Cost, total of contracts and amount paid for land, \$169,000. Bonds, authorized, \$20,000.

FRANKLIN.—History—Built in '87-8 by town.

Water Supply—Six 6-in. driven wells, 64 ft. deep, connected with 6, 8 and 12-in. pipe, by direct pumping.

Pumping Machinery—Dy. cap., 1,500,000 galls.

Distribution—Mains, c. i., 5½ miles. Services, lead. Taps, 186. Meters, 1. Hydrants, 61.

Consumption, not given. Pressure, ordinary, 40 lbs. Fire, 100 lbs.

Financial—Cost, \$43,000. Bonded debt, \$45,000. Int., 5%. Ann. op. exp., \$2,400. Ann. rev., \$1,500.

FREMONT.—History—Built in '82-3 by city.

Water Supply—Mainly from springs, pumping from storage reservoir to stand pipe.

Reservoir—Cap., about 2,500,000 galls.; 100x200 ft., x15 ft. deep; within city limits, near Sandusky river.

Pumping Machinery—Dy. cap., 4,000,000 galls.

Stand-Pipe—Cap., 367,000 galls.; Otis' steel, 25x100 ft.; on hill near center of distribution, ½ mile from pumps, 50 ft. above center of city.

Distribution—Mains, c. i., 12 miles. Services, galv. i., lead. Taps, 413. Meters, 7. Hydrants, 110.

Consumption, 533,285 galls. Pressure, ordinary, 48 lbs. Fire, 90 lbs.

Financial—Cost, \$148,000. Debt, \$136,000. Int., 5%. Sinking fund, \$6,000. Ann. op. exp., \$4,102. Ann. rev.: consumers, \$6,686.

GALION.—History—Built in '82-4 by Galion Water-Works Co., under 30 years franchise.

Water Supply—Wells, 30 ft. in diam. and 28 ft. deep, pumping to stand-pipe.

Pumping Machinery—Dy. cap., 3,000,000; two Deane.

Stand-Pipe—Is 6x140 ft.

Distribution—(In '87.) Mains, c. i., 10 miles. Services, galv. i. Taps, 250. Meters, none. Hydrants, 95.

Consumption (in '87), 350,000 galls. Pressure, ordinary, 30 lbs. Fire, 80 lbs.

Financial—(In '87.) Cost, \$100,000. Cap. stock, \$100,000. Bonds, \$70,000. Int., 6%. Ann. op. exp., \$300,000. Ann. rev.: consumers, \$3,000; city, \$5,000. Hydrant rental, \$60, \$50 and \$35, according to number, not given.

GRANVILLE.—History—Built in '85 by town.

Water Supply—Driven wells, pumping to tank.

Pumping Machinery—Dy. cap., 180,000 galls.

Tank—Cap., 95,000 galls.; 20x30 ft.

Distribution—Mains, c. i., w. i., $5\frac{1}{2}$ miles. Services, galv. i., black i. Taps, 124. Meters, 1. Hydrants, 37.

Consumption, 25,000 galls. Pressure, 87 lbs.

Financial—Cost, \$18,000. Debt, \$13,400. Int., 6%. Ann. op. exp., \$531. Ann. rev.: consumers, \$1,008.

HAMILTON.—History—Built in '84 by city.

Water Supply—Wagner steamed filter wells, pumping to reservoir and direct.

Pumping Machinery—Dy. cap., 3,000,000 galls.

Reservoir—Cap., 6,703,885 galls.

Distribution—Mains, c. i., 30 miles. Services, w. i., lead. Taps, 1,355. Meters, 75. Hydrants, 215.

Consumption, 800,000 galls. Pressure, 95 lbs.

Financial—Cost, \$367,440. Debt, \$365,000. Int., 5%. Ann. op. exp., \$12,279. Ann. rev.: consumers, \$15,544; city, \$18,000. Hydrant rental, \$75.

IRONTON.—History—Built in '70-1 by city.

Water Supply—Ohio river, pumping to tank.

Pumping Machinery—Dy. cap., 2,500,000 galls.

Tank—Cap., 160,000 galls.; 40x18 ft.

Distribution—Mains, c. i., 11 miles. Services, w. i., lead. Taps, 1,243. Meters, none. Hydrants, Chapman, Holly, 157. Valves, Chapman, Holly.

Consumption, 1,600,000 galls. Pressure: Ordinary, 40 lbs. Fire, 90 lbs.

Financial—Cost, \$185,000. Debt, \$155,000: \$18,000 at 8, \$90,000 at 5, \$47,000 at 4%. Ann. op., exp., \$7,000. Ann. rev.: consumers, \$18,000.

KENT.—Portage Co. (Pop., 3,309; est., 4,000.) On Cuyahoga river, 10 miles N. E. of Akron. No sewers.

History—Built in '86-7 by Kent Water Co., under 20 years franchise.

Water Supply—Plum creek, pumping to stand-pipe and direct.

Storage and Subsiding Reservoir—Cap., 10,000,000 galls.; on creek.

Pumping Machinery—Dy. cap., 3,000,000 galls; two 1,000,000 Gaskill dup. Boilers: two horizontal tubular, each 5x16 ft.

Stand-Pipe—Cap., 115,000 galls.; 14x100 ft.; top, 200 ft. above pumping station.

Distribution—Mains, c. i., $8\frac{1}{2}$ miles. Services, w. i., lead. Taps, 239. Meters, none. Hydrants, Holly, 77. Valves, Holly.

Consumption, 207,000 galls. Pressure: Ordinary, 100 lbs. Fire, 150 lbs.

Financial—Cost, withheld, est., \$150,000. Cap. stock, \$100,000. Bonded debt, \$80,000. Int., 6%. Ann. op. exp., \$2,900. Ann. rev.: consumers, \$2,900; city, \$3,750. Hydrant rental, \$50.

KENTON.—Hardin Co. (Pop., 3,940; est., 6,000.) On Scioto river. Has sewers.

History—Built in '81-2 by private Co., now owned by city.

Water Supply—Well, by direct pumping. Well was sunk in limestone, 20 ft. in diam. and 24 ft. deep.

Pumping Machinery—Dy. cap., 2,500,000 galls.; 1,500,000 Holly quadruplex, 1,000,000 Gaskill dup.

Distribution—Mains, c. i., 8 miles. Services, lead. Taps, 267. Meters, 2. Hydrants, kind not given, 71.

Consumption, 700,000 galls. Pressure: Ordinary, 60 lbs. Fire, 85 lbs.

Financial—Cost, \$94,000. Bonded debt, \$80,000. Int., 6%. Sinking fund, about \$4,000. Ann. op. exp., \$3,500. Ann. rev.: consumers, \$4,200.

LANCASTER.—Fairfield Co. (Pop., 6,803; est., 8,000.) On Hocking river, ground rising from river and Hocking canal to Hill 263 ft. above canal.

History—Built in '80-2 by town; in '77 fire protection works were built, consisting of small pump and single line of pipe, taking water from Hocking canal. In '78 stand-pipe was added, and in '80-2 works extended for domestic supply.

Water Supply—Gallery and well, pumping to tank.

Gallery and Well—Gallery in gravel, 4 ft. wide and 4½ ft. high, with brick side walls and arched top; takes water from bottom. At first it was 270 ft. long. Gallery connects with well 18 ft. in diam., 20 ft. deep. In '82 water rose to surface and wasted over top.

Pumping Machinery—Dy. cap., 1,200,000 galls.; Worthington, 20x15-in. steam, 12-in. water cylinders. First pump was small and boiler inadequate. For a time steam was piped to engine from iron works, 200 ft. distant.

Stand-Pipe—Cap., 133,000 galls.; 18x70 ft.; 133 ft. above water in suction pipe at well, 64 ft. above pump.

Distribution—(In '87.) Mains, 12, 10 and 6-in. c. i., 8 miles. Services, lead. Taps, 100. Meters, none. Hydrants, Chapman, 65.

Consumption (in '87), 200,000 galls. Pressure, 55 lbs.

Financial—Cost (to Mar. 20, '82), \$46,801. Debt, \$25,000. Int., not given. Ann. op. exp. (in '87), \$2,000. Ann. rev.: consumers (in '87), \$3,000; city, none.

LEETONIA.—History—Built in '89 by village.

Water Supply—Spring, by gravity to collecting basin, thence by gravity to supply reservoir at pumps, thence by direct pumping, surplus going to small storage reservoir. Spring walled with brick and covered with flag-stone.

Collecting Reservoir—Cap., not given; vitrified brick, roofed and shingled.

Conduit—To supply reservoir, 2,000 ft. 12-in. c. i.

Supply Reservoir—Cap., not given. Same as receiving reservoir.

Pumping Machinery—Dy. cap., 2,000,000 galls.

Storage Reservoir—Cap., 500,000 galls.; circular, 19 ft. deep. Like other two.

Distribution—Mains, 12 to 4-in. c. i., 6 miles. Services, lead. Taps, 130. Hydrants, 55.

Pressure: Ordinary, 40 to 80 lbs. Fire, 120 lbs.

Financial—Cost, \$41,000. Bonds, \$45,000. Int., 5%.

LIMA.—History—Built in '85-7 by city.

Water Supply—Surface water, by gravity from impounding to storage reservoir, thence by direct pumping.

Reservoirs—Cap., not given. Impounding: area, 6 acres; depth, 8½ ft. Distributing: area, 21 acres; depth, 18 ft.

Pumping Machinery—Dy. cap., 6,000,000 galls.

Distribution—Mains, c. i., 20¼ miles. Services, galv. i. Taps, 832. Meters, 6. Hydrants, 154.

Consumption, 414,198 galls. Pressure: Ordinary, 30 lbs. Fire, 75 lbs.

Financial—Cost, \$338,000. Bonded debt, \$338,000. Int., 5%. Ann. op. exp., \$5,169. Ann. rev.: consumers, \$9,147.

LONDON.—History—Construction began Dec. 20, '89, by The John P. Martin Co.; to be in operation July 1, '90.

Water Supply—Cook's wells, 6-in., pumping direct and to stand-pipe.

Pumping Machinery—Dy. cap., 1,500,000 galls.

Stand-Pipe—Cap., 293,000 galls.; 20x125 ft.

Distribution—Mains, 14 to 4-in. c. i., 11 miles. Hydrants, 100.

Financial—Cost, est., \$110,000.

LORAIN.—History—Built in '84 by town.

Water Supply—Lake Erie, by direct pumping.

Pumping Machinery—Dy. cap., 1,000,000 galls.

Distribution—Mains, Wyckoff wood, 11.2 miles. Services, w. i., lead. Taps, 500. Meters, 1. Hydrants, 45.

Consumption, 500,000 galls. Pressure: Ordinary, 55 lbs. Fire, 150 lbs.

Financial—Cost, \$47,000. Bonded debt, \$50,000. Int., 6%. Ann. op. exp., \$3,000.

Ann. rev.: consumers, \$4,500.

MANSFIELD.—History—Built in '70-2 by city.

Water Supply—Five flowing artesian wells and two springs, by direct pumping.

Pumping Machinery—Dy. cap., 3,000,000 galls.

Distribution—Mains, c. i., 23 miles. Services, w. i. Taps, 945. Meters, none. Hydrants, 130.

Consumption, 1,250,000 galls. Pressure: Ordinary, 95 lbs. Fire, 95 to 120 lbs.

Financial—Cost, \$199,000. Debt, \$27,000. Int., 6 and 8%. Ann. op. exp., \$5,914.

Ann. rev.: consumers, \$10,000.

MARIETTA.—History—Construction begun Dec. 1, '89, by city; expected to be in operation July 1, '90.

Water Supply—Well near Ohio river, pumping direct and to stand-pipe.

Pumping Machinery—Dy. cap., 1,250,000 galls.

Force Mains—Diam., 12 ins.

Stand-Pipes—Cap., 698,000 galls.; each 30x66 ft.; steel.

Distribution—Mains, 10 to 4 in. c. i., 12 miles. Hydrants, 104.

Pressure: Ordinary, 65 to 95 lbs.

Financial—Cost, est., \$85,000.

MARION.—History—Built in '89-90 by Scioto Water Co., under 25 years' exclusive franchise.

Water Supply—Water bearing gravel, 3 miles west of city, pumping to stand-pipe. Water is gathered and stored in reservoir.

Reservoir—Cap., 15,000,000 galls.; water surface, 5 acres; min. depth, 10 ft.

Canal—To pump-well; open, 800 ft. long.

Pumping Machinery—Dy. cap., 3,000,000 galls.

Force Main—C. i., 16-in., 2½ miles long.

Stand-Pipe—Cap., 330,480 galls.; iron, 25x90 ft.; solid stone foundation, 20 ft. high; 130 ft. above business part of town.

Distribution—Mains, 16 to 4-in. c. i., 11½ miles. Hydrants, 143.

Pressure: Ordinary, 50 lbs. Fire, 100 lbs.

Financial—Cost, est., \$450,000. Cap. stock, \$250,000. Bonds, \$200,000. Int., 6%.

MARTIN'S FERRY.—History—Built in '86-7 by city; water first supplied Dec. 15, '87.

Water Supply—Ohio river, pumping through distribution to reservoir.

Pumping Machinery—Dy. cap., 1,000,000 galls.

Reservoir—Cap., 2,500,000 galls.; area, 0.9 acre; depth, 10 ft.; on side hill. Banks of clay, built up in layers, wet, rammed and rolled; no heartwall; 12 ft. high, 14 ft. wide on top. Inner slopes, 2 to 1, paved with 1 ft. of cut stone, laid dry on 18 ins. of puddle, puddle omitted on upper, or excavated, side. Paving surmounted by coping 1 ft. high, 2 ft. wide. Outer slopes, $1\frac{3}{4}$ to 1. Bottom covered with 4 ins. broken stone on 8 ins. of puddle. Influent and Effluent Chamber: masonry with concrete bottom; about 5 ft. sq., 12 ft. deep; at foot of inner slope, top 2 ft. above bottom of reservoir. Water discharges over top of chamber. Discharge pipes: two; 12 in. influent and effluent, 14 in. drain; slope of former, 7 to 1; latter, 36 to 1. Reservoir does not leak. Built in '87-8. Cost, \$17,472.

Distribution—Mains, c. i., $7\frac{1}{2}$ miles. Services, lead. Taps, 296. Meters, none. Hydrants, 49.

Consumption, 120,000 galls. Pressure, 100 lbs.

Financial—Cost, \$114,000. Bonded debt, \$120,000. Int., 5%. Ann. op. exp., \$2,000. Ann. rev.: consumers, \$1,200.

MASSILLON.—

PRESENT WORKS.

History—Built in '85-6, and put in operation Feb., '87, by Massillon Water Co., under a 20-years' charter.

Water Supply—Sippo lake, filtered, pumping to stand-pipe.

Pumping Machinery—Dy. cap., 4,000,000 galls.

Filter—Dy. cap., not given; National.

Stand-Pipe—Cap., 550,000 galls.; 25x150 ft.

Distribution—(In '87.) Mains, c. i., 17 miles. Services, w. i., lead. Taps, 586. Meters, 9. Hydrants, 160.

Consumption, not given. Pressure: Ordinary, 75 lbs. Fire, 150 lbs.

Financial—(In '87.) Cost, \$287,500. Cap. stock, \$250,009. Bonded debt, \$250,000, Int., 6%. Ann. op. exp., \$4,200. Ann. rev.: consumers, \$15,350; city, \$6,600. Hydrant rental, \$41.25.

NOTE.—Later figures under Distribution and Financial refused.

MEDINA.—General Description—Built for fire protection by town, date not given. Mains, 8 and 10 in. Hydrants, Philadelphia.

MIDDLETOWN.—History—Built in '73-4 by town, under direction of Trustees.

Water Supply—Well, 23 ft. in diam., 33 ft. deep, by direct pumping.

Pumping Machinery—Dy. Cap., 3,000,000 galls.

Distribution—(In '87.) Mains, c. i., 12 miles. Services, lead. Taps, 500. Meters, 1. Hydrants, 75.

Consumption, (in '87), 500,000 galls. Pressure: Ordinary, 43 lbs. Fire, 90 lbs.

Financial—(In '87.) Cost, \$74,000. Bonded debt, \$75,000. Int., 5%. Ann. op. exp. (in '85), \$1,200. Ann. rev.: consumers, \$4,500, city, none.

MILAN.—History—Built in fall of '88 by village. In Aug., '89, works not in use, having been locked up by Contrs. Council is divided over payment of debt of about \$5,500, which trustees incurred above \$10,000 originally voted.

Water Supply—Ground water, gathered in infiltration reservoir thence by gravity.

Reservoir—Is 90x144 ft. x 20 deep, with slopes 2 to 1.

Pumping Machinery—Dy. cap., 1,000,000 galls.

Distribution—Mains, 8 to 4 in. c. i., $2\frac{1}{2}$ miles. Services, not given. Taps, none. Meters, none. Hydrants, 23.

Consumption, none, at present. Pressure; Ordinary, 75 lbs. Fire, 150 lbs.

Financial—Cost, \$15,500. Bonded debt, \$14,500; \$5,500 at 6, \$9,000 at 5%. Ann. op. exp. and rev., none, time of report.

MINERVA.—History—Built by town.

Water Supply—Well, on bank of creek, pumping to tank. Pipe connects with creek for use in case of necessity.

Pumping Machinery—Dy. cap. 240,000 galls.

Distribution—Mains, c. i., $2\frac{1}{2}$ miles. Services, w. i. Taps, 70. Meters, 27. Hydrants, 25.

Consumption, 27,000 galls. Pressure, 65 lbs.

Financial—Cost \$13,600. Bonded debt, \$12,000. Int., 5%. Ann. op. exp., \$340. Ann. rev., \$820.

MOUNT GILEAD.—History—Built in '87 by town.

Water Supply—Two large springs, pumped $\frac{1}{2}$ mile by two hydraulic rams; these furnish about 16 lbs. of water per hour. At night water is forced into public cisterns for fire protection. Water is raised 57 ft. from one spring and 72 ft. from other.

Distribution—Mains, about $1\frac{1}{2}$ miles. Six public watering places; also 5 cisterns.

Financial—Cost, not given. Ann. op. exp., nominal. Rev., none.

MOUNT VERNON.—History—Built in '82 by town.

Water Supply—Surface and artesian well, pumping to stand-pipe.

Pumping Machinery.—Dy. cap., 2,000,000 galls.

Stand-pipe—Cap., 205,000 galls.; 25×56 ft.

Distribution—Mains, c. i., 13 miles. Services, w. i. Taps, 615. Meters, none. Hydrants, 81.

Consumption, 375,000 galls. Pressure, ordinary, 97 lbs. Fire, 125 lbs.

Financial—Cost \$85,500. Bonded debt, \$60,000. Int. 6%. Ann. op. exp. \$3,500. Ann. rev., consumers, \$5,500.

NATIONAL MILITARY HOME.—History—Built in '70 by U. S. Govt.; supplemental works built in '86.

Water Supply—At first, surface water pumping to tank. In '86, six 6-in. tubular wells were sunk, $1\frac{1}{2}$ miles east of the Home grounds, and water pumped from them through a 10-in. main to a reservoir on grounds, then repumped to tank.

Pumping Machinery—Dy. cap., 3,000,000 galls.

Reservoir—No data.

Tank—Cap., not given.

Distribution—Mains, c. i., 3 miles. Services, c. i. Taps, 75. Meters, none. Hydrants, 22.

Consumption, about 400,000 galls. Pressure: ordinary, 65 lbs. Fire, 80 lbs.

Financial—Cost, \$37,500. No debt. Ann. op. exp., not given.

NEWARK.—History—Built in '85-6 by Moffett, Hodgkins & Clarke, Syracuse, N. Y., under 10-years, franchise.

Water Supply—Two surface wells in gravel, pumping to reservoir. First well was formed by sinking timber and masonry caisson, 30 ft. in diam., 24 ft. deep, water coming from gravel.

Pumping Machinery—Dy. cap., 5,000,000 galls.

Reservoirs—Cap., 3,000,000 galls.; 262 ft. above city.

Distribution—Mains, c. i., 25 miles. Services, galv. i. Taps, 622. Meters, 18. Hydrants, 221.

Consumption, 589,900 galls. Pressure, 120 lbs.

Financial—Cost, \$300,000. Debt, \$260,000. Int. 6%. Ann. op. exp., \$6,000. Ann. rev.: consumers, \$12,500; city, \$9,825. Hydrant rental, \$48 for 200, and \$45 for additional.

NEW LISBON.—History—Built in '40; new works built in '88, by town.

Water Supply—Four artesian wells, pumping to reservoir. First supply from springs, water being conducted through $\frac{1}{2}$ mile of 4-in. wooden and iron pipe to reservoir 120 x 250 ft., formed by stone dam 20 ft. high and 120 ft. long, built across ravine, 80 ft. above center of town. Old system used in case of emergency.

Pumping Machinery—Dy. cap., 300,000 galls.

Reservoir—Cap., 400,000 galls.; masonry.

Distribution—Mains, c. i., $4\frac{3}{4}$ miles. Services, w. i. Taps, 130. Meters, 1. Hydrants, 38.

Consumption, 55,000 galls. Pressure, 47 to 115 lbs.

Financial—Cost \$25,000. Bonded debt, \$16,000. Ann. appropriation for sinking fund, \$1,000. Int. 6%. Ann. op. exp., \$1,300. Ann. rev.: consumers, \$900.

NEW PHILADELPHIA.—History—Built in '86, under 15-years, franchise, by New Philadelphia Water Co., which is controlled by American Water-Works & Guarantee Co., Ltd., Pittsburgh, Pa.

Water Supply—Wells and Tuscarawas river, pumping to reservoir.

Pumping Machinery—Dy. cap., 2,000,000 galls.:

Reservoir—Cap., 2,500,000 galls.

Distribution—Mains, c. i., 9 miles. Services, galv. i. Taps, 252. Meters, 10. Hydrants, 86.

Consumption, 250,000 galls. Pressure, 110 lbs.

Financial—Cost, not given, est., \$100,000. Cap. stock, \$100,000. Bonds, \$65,000. Int., 6%. Ann. op. exp., withheld, est., \$2,500. Ann. rev.: total est., \$8,000. Hydrant rental, \$36.

NORWALK.—History—Built in '71-2 by town and reconstructed in '78.

Water Supply—Peru branch of Huron river, by direct pumping.

Pumping Machinery—Dy. cap., 2,000,000 galls.

Dam and Reservoir—Cap., not given. Dam across stream, $1\frac{1}{4}$ miles from center of town and 58 ft. below it, forms reservoir. New stone dam was built in '80.

Filter—Proved ineffective. Was of gravel; water passed into and through it horizontally; area was too small.

Flume—From reservoir to pump-well.

Pump-Well—Is 23 ft. in diam. and 24 ft. deep; water stands about 16 ft. deep.

Distribution—Mains, c. i., 14 miles. Services, w. i. Taps, 400. Meters, none. Hydrants, 111.

Consumption, 900,000 galls. Pressure: Ordinary, 45 lbs. Fire, 85 lbs.

Financial—Cost, \$140,000. Debt, \$15,000. Int., 4%. Ann. op. exp., \$5,000. Ann. rev.; consumers, \$5,500.

OBERLIN.—History—Built in '87 by town; put in operation Dec. 23.

Water Supply—Springs, by direct pumping.

Storage Reservoir—Cap., 5,000,000 galls.

Pumping Machinery—Dy. cap., 2,000,000 galls.

Distribution—Mains, c. i., 7 miles. Services, galv. i. Taps, 85. Meters, 5. Hydrants, 60.

Consumption, unknown.

Financial—Cost, \$54,000. Debt, \$50,000. Int., $4\frac{1}{2}$ %. Ann. op. exp., \$1,500. Ann. rev.: consumers, \$700.

OHIO PENITENTIARY.—Columbus—History—Built in '85 by State.

Water Supply—Scioto river, pumping to stand-pipe.

Pumping Machinery—Dy. cap., 2,000,000 galls.

Stand-Pipe—Cap., 108,000 galls.; 12x108 ft.

Distribution—Mains, 8-in. c. i., 1 mile. Taps, 45. Meters, none. Hydrants, 11.

Consumption, 1,000,000 galls. Pressure: Ordinary, 60 lbs. Fire, 120 lbs.

Financial—Cost, \$15,000.

PAINESVILLE.—History—Built in '82 by Painesville Water Works Co.

Water Supply—Wells and springs, pumping to stand-pipe and direct. Change of supply was contemplated in '89.

Storage Reservoir—No data.

Pumping Machinery—Dy. cap., 2,000,000 galls.

Stand-Pipe—Cap., 169,000 galls.; 20x72 ft.

Distribution—Mains, c. i., 8 miles. Services, galv. i. Taps, 350. Meters, none. Hydrants, 50.

Consumption, 300,000 galls. Pressure: Ordinary, 50 lbs. Fire, 85 lbs.

Financial—(In '87.) Cost, withheld, est., \$115,000. Cap. stock, \$150,000. Bonds, \$120,000. Int., not given. Ann. op. exp., \$3,500. Ann. rev.: consumers, \$3,000; city, \$4,500. Hydrant rental, \$90 for first 50, \$50 for each additional.

PIQUA.—History—Built in '75 by city.

Water Supply—Surface water, by direct pumping. Water is taken from hydraulic canal fed from Lewiston reservoir at headwaters of Great Miami river.

Pumping Machinery—Dy. cap., 3,500,000 galls.

Distribution—Mains, c. i., 14 miles. Services, galv. i. Taps, 820. Meters, none. Hydrants, 141.

Consumption, 2,000,000 galls. Pressure: Ordinary, 40 lbs. Fire, 90 lbs.

Financial—Cost, \$380,000. Debt, \$290,000. Int., 6 and 8%. Ann. op. exp., \$2,400. Ann. rev.: consumers, \$7,200.

PORTSMOUTH.—History—Built in '71 by city.

Water Supply—Ohio river, by direct pumping.

Intake—Brick and wood conduit, 210 ft. long.

Pumping Machinery—(In '82.) Dy. cap., 2,000,000 galls.

Distribution—(In '87.) Mains, 16 to 4-in. c. i., 20 miles. Services, w. i. Taps, about 1,300. Hydrants, 100.

Consumption, about 2,000,000 galls. Pressure: Ordinary, 45 lbs. Fire, about 100 lbs.

Financial—(For '82.) Cost, \$200,000. Bonded debt, \$150,000. Int., 8%. Ann. op. exp., \$11,596. Ann. rev.: consumers, \$13,881.

RAVENNA.—History—Built in '85 by the town.

Water Supply—Crystal Lake, by direct pumping.

Pumping Machinery—Dy. cap., 3,000,000 galls.

Distribution—Mains, c. i., 13 miles. Services, galv. i., lead. Taps, 655. Meters, none. Hydrants, 96.

Consumption, 200,000 galls. Pressure, 50 lbs.

Financial—Cost, \$90,000. Debt, \$90,000: \$15,000 at 6, \$75,000 at 5%. Ann. op. exp. \$2,700. Ann. rev.: consumers, \$6,000; city, none.

SALEM.—

PRESENT WORKS.

History—Built in '87 by the Salem Water Co., under 20 years' franchise.

Water Supply—Artesian wells and surface springs, pumping from collecting reservoir to stand-pipe.

Reservoir—Cap., 600,000 galls.

Pumping Machinery—Dy. cap., 3,000,000 galls.

Stand-Pipe—Cap., 312,000 galls.; 25x85 ft.

Distribution—Mains, c. i., 15 miles. Services, galv. i. Taps, 811. Meters, 20. Hydrants, 163.

Consumption, 200,000 galls. Pressure: Ordinary, 75 lbs. Fire, 125 lbs.

Financial—Cost, withheld, est., \$200,000. Cap. stock, \$250,000. Debt, and in. withheld. Ann. op. exp., withheld, est., \$3,000. Ann. rev.: total, withheld, est. \$15,500. Hydrant rental, \$25; hydrants placed 500 ft. apart.

SANDUSKY.—History—Built in '75-6 by city.

Water Supply—Sandusky bay, pumping to stand-pipe. Water taken from cove in bay, which is shut off from contamination with impurities discharged by Sandusky river.

Intake Crib—Octagonal; inner diam., 25, outer, 45 ft.; two double rows of timber walls, 8 ft. apart, filled between with broken sandstone. It extends from rock bottom to 6 ft. above ordinary water level.

Intake Conduit—From crib to pump-well, 1,800 ft. long. First 1,387 ft. 36-in. w. i., remaining 413 ft., 36-in. brick conduit. Pipe is laid in a trench prepared by dredging and submarine blasting. It was floated and lowered to place by scows and chains. A flanged half-sleeve was riveted on ends of each section, the two bolted together, then cemented. Crib end of pipe has vertical elbow, at upper end of which is perforated copper plate screen. In Feb., '80, copper screen was found to be covered with tough fibrous fungus growth which when dried was non-combustible and resembled moss. Intake pipe becoming empty rose from its anchorage and separated at joint near coffer-dam.

Pump-Well—In solid rock, 8x22 ft., 21½ ft. below engine house floor; lined with brick.

Pumping Machinery—Dy. cap., 10,500,000 galls.

Stand-Pipe—Double, outer pipe being 25x180 ft., with storage cap. above 160 ft. of 276,000 galls. Inside of this is a pipe 3x225 ft. for fire protection. Each pipe is built of steel plates, those in the outer one running from ¾-ins. thick at bottom to 3-16 ins. at top. Bottom course is leaded into c. i. shoes, constructed in segments with flanges and bolts, and forming, when in place, a perfect circle. It rests in a groove cut in the solid rock. Riveted to second course of pipe are twelve 1½-in. iron rods passing 8 ft. into the rock, and secured by lead and wedges. There is an iron staircase on lake side of pipe.

Oct. 20, '78, inner pipe burst 100 ft. below top, falling against the top of outer pipe and injuring a section 25 ft. long. After repairs inner pipe was of ¼-in. plates for 140 ft., 3-16 for 60, ½-in. for 25 ft.

Distribution—Mains, 20 to 3 in. c. i. 26½ miles. Services, c. i., w. i., lead Taps, 1,692. Meters, 63. Hydrants, 179.

Consumption, 2,089,630 galls. Pressure: Ordinary, 35 to 70 lbs. Fire, 95 lbs.

Financial—Cost, \$433,432. Debt, \$379,000. Int., 5 and 7%. Sinking fund, \$150,000. Ann. op. exp., \$12,172. Ann. rev.: consumers, \$18,426. Op. exp. '80, \$8,213. Rev., '80, \$11,129. Total op. exp., Sept., '76, to Dec. 31, '88, \$127,103. Do., rev., \$165,559.

SIDNEY.—History—In '88 new works were designed by Geo. Hornung, Cincinnati, distribution system of old works being only part retained.

Water Supply—Great Miami river and wells, pumping to stand-pipe.

Pumping Machinery—Dy. cap., 2,500,000 galls.

Filter—Cap., 500,000 galls.; American.

Stand-Pipe—Cap., 212,000 galls.; 25x85 ft.

Distribution—(Includes old and new.) Mains, c. i., 7 miles. Services, lead. Taps, 165. Meters, none. Hydrants, 55.

Consumption, 9,000 galls. Pressure: (Old works.) Ordinary, 50 lbs. Fire, 100 lbs.

Financial—Cost, about \$110,000. Bonded debt, \$66,000, of which \$16,000 is on old works. Int., old rate, 6%. Ann. op. exp., \$300. Ann. rev.: consumers, \$759.

NOTE—Above subject to corrections, as no answers have been made to inquiries since shortly after letting of contracts for new works.

SPRINGFIELD.—History—Built in '81-2 by city.

Water Supply—Springs in gravel, pumping from collecting reservoir to stand-pipe.

Reservoir—Cap. not given; in excavation, 140x290 ft. on top, 15 ft. deep; slopes, 3 to 1. Discharge-pipe: 20-in. Built in '87. Cost, about \$4,000.

Old Filter—Filter gallery was first built along bank of Buck creek, and two wells dug 100 feet apart, connected by dry stone culvert, 3 ft. in diam.

New Filter—Built in '88; unofficially reported as 900 ft. long, 4x5 ft. in cross-section, wood, with spaces for water to enter from gravel formation. Surrounded by broken stone and gravel, 25 ft. below bottom of wells.

Pumping Machinery—Dy. cap., 8,000,000 galls.

Stand-Pipe—Cap., 592,000 galls.; 30x112 ft.; 220 ft. above center of city.

Distribution—Mains, c. i., 33½ miles. Services, lead. Taps, 1,856. Meters, 60. Hydrants, 295.

Consumption, 2,000,000 galls. Pressure, 80 lbs.

Financial—Cost, \$419,621. Debt, \$410,000. Int., 5%. Ann. op. exp., \$16,600. Ann. rev.: consumers, \$24,361; city pays interest on bonds, \$20,000, raising money by taxation.

STEUBENVILLE.—Low water in river is 640½ ft. above sea.

History—Supplied prior to '35 from springs through wooden pipes. In '35, town built works, and in '67 extended them.

Water Supply—Ohio river, pumping to reservoir. Supply taken below point where city drainage discharges.

Intake Pipe—Two 15-in. pipes are laid on bed of river for 300 ft., and connect with pump-well.

Pumping Machinery—Dy. cap., 1,000,000 galls.

Force Main—Diam., 20 ins.

Reservoirs—Cap., 2,000,000 galls. In '35 a 400,000-gall., and in '67 a 600,000-gall. reservoir was built. It is not stated whether these are still in use, and no description of an additional reservoir is given.

Distribution—(For '87.) Mains, 4 to 20-in. c. i., 30 miles. Services, lead. Taps, (in '82), 1,725. Meters, none. Hydrants, 140.

Consumption, 1,000,000 galls. Pressure: Ordinary, 65 lbs.

Financial—(In '87.) Cost, said to be unknown, est., \$400,000. No debt. Ann. op. exp., \$7,500. Ann. rev.: consumers (in '81), \$16,750; city, \$22,000.

TIFFIN.—History—Built in '78-9 by Tiffin Water-Works Co., under 25-years' franchise.

Water Supply—Sandusky river, by direct pumping.

Dam and Canal—Dam built to furnish water-power for pumping; 230 ft. long. Canal conveys water to pumps.

Reservoir—Small; near canal, from which it is filled by 12-in. pipe; 12-in. pipe leads to pump-well, and waste-pipe discharges to river.

Pumping Machinery—Dy. cap., 7,000,000 galls.

River Crossings—Pumps being on north side of city, one mile above its center, river is crossed at pump-house by 16-in. main, and near center of city by 12-in.; 16-in. main is laid down south, and 10-in. main down north, shore.

Distribution—Mains, c. i., w. i., 15 miles. Services, w. i. Taps, 750. Meters, 30. Hydrants, 114.

Consumption, 650,000 galls. Pressure, 110 lbs.

Financial—Cost to '84, \$175,000. Debt and int., not given. Ann. op. exp., withheld, est., \$5,000. Ann. rev.: total, withheld, est., \$18,000. Hydrant rental, av., about \$75.

TOLEDO.—History—Built in '73-4 by city.

Water Supply—Maumee river, filtered, pumping to stand-pipe.

Intake Crib—Irregular hexagon, with two sides 80 ft. long and parallel to current of river, and other four sides each $37\frac{1}{2}$ ft. long. Formed by two rows of ground piles driven close together, with space between filled on outside with broken stone, on inside with gravel.

Intake Conduit—From crib to filter basin. Brick, 5 ft. in diam., 500 ft. long, built in open trench on land, by means of a coffer-dam in water.

Filter Basin—Area, 19,000 sq. ft.; slopes, $1\frac{1}{2}$ ft. to 1, finished with puddle wall, paved with sandstone. Bottom of concrete, and from bottom up filtering material consists of 24 ins. of broken stone, 6 ins. each of 2, 1, $\frac{1}{2}$ and $\frac{1}{4}$ -in. gravel, and 24 ins. of fine sand.

Max. depth of water is 4 ft., and it passes to clear water basin through gathering drains and effluent pipe, thence to pump-wells.

In '75 filter bed filled so rapidly with silt that it was almost useless, and since then it has been inadequate.

Pumping Machinery—Dy. cap., 15,000,000 galls.

Stand-Pipe—Of No. 1 charcoal iron, $\frac{1}{2}$ -in. thick, 5×224 ft.; 260 ft. above river, 240 ft. above pumps; inclosed in an ornamental masonry tower.

Submerged Pipe—On line to E. Toledo, 1,600 ft. 16-in., laid beneath Maumee river in '88.

Distribution—Mains, c. i., 63 miles. Services, lead. Taps, 3,210. Meters, 349. Hydrants, 435. Close of '80: Mains, 46.8 miles. Taps, 1,732. Meters, "no record." Hydrants, 349.

Consumption, 4,774,829 galls. Pressure: Ordinary, 50 lbs. Fire, 98 lbs.

Financial—Cost, about \$1,250,000. Debt, \$1,000,000. Int., 8%. Ann. op. exp., \$21,683. Ann. rev.: consumers, \$65,398; city, by taxation, \$80,000. Total disbursements to Jan. 1, '89, \$1,145,477. Rev., consumers, '80, \$26,123. Total rev., to close of '88, \$517,889.

TROY.—History—Built in '86 by town.

Water Supply—Well, 25 ft. in diam., 20 ft deep, 9 ft. being through gravel.

In May, '89, supply from well had begun to diminish.

Reservoir—Area, 40 acres; used only to store water for power.

Pumping Machinery—Dy. cap., 2,000,000 galls.

Distribution—Mains, c. i., $8\frac{1}{2}$ miles. Services, w. i., lead. Taps, 380. Meters, none. Hydrants, 84.

Consumption, 24,000 galls. Pressure: Ordinary, 40 lbs. Fire, 70 to 90 lbs.

Financial—Cost, \$80,000. Debt, \$80,000. Int., 6%. Ann. op. exp., \$1,300. Ann. rev.: consumers, \$2,100.

UPPER SANDUSKY.—History—Built in '89-90 by Upper Sandusky Water Co., under 20-years' franchise; put in operation April 1.

Water Supply—Springs, pumping from two collecting wells to stand-pipe and direct. Wells are 100 ft. in diam.

Pumping Machinery—Dy. cap., not given.

Stand-Pipe—Cap., 200,000 galls.

Distribution—Mains, 12 to 4-in., $12\frac{1}{2}$ miles. Hydrants, 100. Valves, Bourbon. Pressure: Ordinary, 60 lbs. Fire, 150 lbs.

Financial—Cost, \$100,000. Cap. stock and debt, withheld. Int., 6%. Hydrant rental, \$40.

URBANA.—History—Built in '78 by Urbana Water-Works Co., under 10-years' franchise.

Water Supply—Well, 20 ft. in diam., 15 ft. deep, by direct pumping.

Pumping Machinery—Dy. cap., 3,500,000 galls.

Distribution—Mains, c. i., 14 miles. Services, lead. Taps, 660. Meters, 1. Hydrants, 110.

Consumption, 700,000 galls. Pressure: Ordinary, 40 lbs.

Financial—Cost, \$125,000. Cap. stock, \$40,000. Bonded debt, \$100,000. Int., 6%. Ann. op. exp., withheld. Ann. rev.: consumers, \$4,000; city, \$6,000. Hydrant rental, \$55.

UHRICHSVILLE.—See Dennison and Uhrichsville.

WADSWORTH.—History—Built in '80 for domestic supply by Wadsworth Water-Works Co., under 10-years' franchise; now owned by R. F. Weaver, who completed works.

Water Supply—Four flowing springs, by gravity; springs about $1\frac{1}{4}$ miles from 80 ft above business part of town; excavated 20x30 ft., x 8 ft. deep, lined with heavy oak timbers.

Distribution—Mains, Wyckoff wood, iron, $6\frac{1}{4}$ miles. Services, galv. i. and lead Taps, 800. Meters, 4. Hydrants, none.

Consumption, unknown. Pressure, 75 lbs.

Financial—Cost, \$15,000. No debt. Ann. op. exp. (in '87), \$200. Ann. rev.: consumers (in '87), \$1,200; city, none.

WARREN.—History—Built in '86-7 by Sam'l R. Bullock & Co., under a 20-years' franchise.

Water Supply—Mahoning river, pumping from filter gallery to stand-pipe.

Filter Gallery—No data.

Pumping Machinery—Dy. cap., 3,000,000 galls.

Stand-Pipe—Cap., 398,000 galls; 22x140 ft.

Distribution—Mains, c. i., 12 miles. Services, w. i., lead. Taps, 309. Meters, 5. Hydrants, 102.

Consumption, 225,060 galls. Pressure: Ordinary, 75 lbs. Fire, 150 lbs.

Financial—Cost (in '87), \$180,000. Cap. stock, \$150,000. Bonded debt, \$150,000. Int., 6%. Ann. op. exp., \$3,500. Ann. rev.: consumers, \$7,500; city, \$4,570. Hydrant rental, \$45 for 100, \$35 for additional.

WASHINGTON COURT HOUSE.—History—Built in '89 by Washington Water Co., under 20 years franchise, after expiration of which city has right to purchase.

Water Supply—Battery of wells, pumping direct and to stand-pipe.

Pumping Machinery—Dy. cap., 3,000,000 galls.

Stand-Pipe—Cap., 294,000 galls; 20x125 ft.

Distribution—Mains, 16 to 6-in. c. i., 16 miles. Services, galv. i., lead. Taps, 450. Hydrants, 132.

Pressure: Ordinary, 40 to 50 lbs. Fire, 60 to 80 lbs.

Financial—Cost, est., \$140,000. Hydrant rental, \$40.

WAYNESBURGH.—Stark Co. General Description—Small system, springs by gravity from receiving basin; $\frac{1}{2}$ mile pipe.

WELLSVILLE.—History—Built by city in '81.

Water Supply—Ohio river, pumping to reservoir.

Intake Crib—Of 8x10-in. oak timbers, 12x16 ft., x10 ft. deep, sunk in river 100 ft. from shore. In the bottom 11 4-in. c. i. pipes, 12 ft. long, were driven 10 ft. deep. These

were perforated for 3 ft. from lower end, which is stopped by a wooden plug. Through these pipes water flows upward into crib.

Pumping Machinery—Dy. cap., 1,500,000 galls.

Force Main—C. i., 10-in.

Reservoir—Cap., 2,500,000 galls.; in excavation; diam., 106 ft. at bottom, 182 ft. at flow line, 17½ ft. above; 334 ft. above pumps. Bottom covered with broken stone on 20-ins. of clay puddle; slopes lined with 4-ins. of brick on 15 ins. of puddle.

Distribution—(In '87.) Mains, 8 to 4-in. c. i., 7 miles. Services, lead. Taps, 600. Meters, 2. Hydrants, 60.

Consumption (in '87), 300,000 galls. Pressure: Ordinary, 100 lbs. Fire, 150 lbs.

Financial—(In '87.) Cost, \$62,500. Debt, \$60,000. Int., 5½%. Ann. op. exp., \$3,800. Ann. rev.: consumers, \$5,900; city, \$3,300, being int. on bonds.

WEST CLEVELAND.—History—Built in '78 by town.

Water Supply—Cleveland water-works, through four 4-in. meters at line dividing two corporations.

Distribution—Mains, kind not given, 4 miles. Services, not given. Taps, 170. Meters, 20. Hydrants, 45.

Consumption, 44,957 galls. Pressure, not given.

Financial—Cost, \$19,000. Debt, \$12,000. Int., 6%. Sinking fund, \$1,300. Ann. op. exp., \$200. Ann. rev.: consumers, \$2,400.

WOOSTER.—History—Built in '69 by town. Rebuilt or extended in '76, Jno. Brinkerhoof.

Water Supply—Springs and well, by gravity from former, by pumping from latter.

Dam—Forms reservoir built in '69; of puddled earth, 300 ft. longx20 ft. high.

Reservoirs—Cap., 12,000,000 galls.; two of 6,000,000 galls. each, receiving and distributing spring and surface water. First one covers about 1½ acres, has an average depth of 10 ft. and is 130 ft. above lowest part of city. One was built by city, other by P. Reddick.

Pumping Machinery—Dy. cap., 500,000 galls.

Distribution—Mains, 12 to 4-in. c. i., 11 miles. Services, ¾-in. galv. i. Taps, 290. Meters, Crown, 6. Hydrants, 103.

Consumption, 150,000 galls. Pressure, 55 lbs.

Financial—Cost, \$115,000. Debt, \$15,000. Int., 6 and 8%. Ann. op. exp., \$1,200. Ann. rev.: consumers, \$3,000; city, none.

XENIA.—History—Built in '87 by Xenia Water-Works Co., under 20 years franchise.

Water Supply—Springs, pumping direct and to stand-pipe.

Dam and Reservoir—Cap., 3,000,000 galls.; area, about 1 acre; depth, 10 to 2 ft. Dam of gravel, with heart-wall; 425 ft. long, 19 ft. high, 12 ft. wide on top, 40 to 60 at bottom. Both slopes, 2 to 1, inner rip-rapped. Heart-wall: clay, with sheet-piling in center; trench 7 ft. wide, 6 ft. deep; first dug, then sheet-piling driven in center till top was about 8 ft. below water-line; trench then filled and heart-wall carried up from natural surface, 6 ft. thick. Spillway: about 20 ft. from end of dam, in earth, lined with plank; 15 ft. wide, 4 ft. deep, free; slope, 2 to 1. Discharge-pipes: two, 14 and 12-in.; slope, slight.

When first filled dam leaked somewhat; several loads of clay were thrown at foot of inner slope and leak stopped.

Pumping Machinery—Dy. cap., 3,500,000 galls.

Stand-Pipe—Cap., 281,000 galls.; 20x115 ft.

Distribution—Mains, 14 to 6-in. c. i., 19 miles. Services, galv. i., lead. Taps, 400. Meters, 5. Hydrants, 180.

Consumption, 300,000 galls. Pressure, Ordinary, 80 lbs. Fire, 150 lbs.

Financial—Cost, \$205,000. Cap. stock, \$200,000. Bonded debt, \$200,000. Int., 6%. Ann. op. exp., \$3,000. Ann. rev.: consumers, withheld, est., \$9,500; city, \$7,500. Hydrant rental, \$37.50 for first 200.

YOUNGSTOWN.—History—Built in '72 by city.

Water Supply—Mahoning river, by direct pumping.

New Conduit—Built in '88 from new pump well to river; brick, 50-ins. in diam., 154 ft. long, 26 ft. below surface. It connects with old pump-well, there being chamber at intersection containing two 36-in. gates.

New Pump-Well—Is 26 ft. deep, 10 ft. inside diam., with brick top 10 ft. high, covered with slate.

Foundation of new pump—Of solid brick and Wampum cement., with pit in center, 6x25 ft.,x10 ft. deep, in which is the Vacuum pump.

Pumping Machinery—Dy. cap., 8,000,000 galls.

Distribution—Mains, c. i., 25 miles. Services, lead. Taps, 1,522. Meters, 90. Hydrants, 195.

Consumption, 1, 717,274 galls. Pressure: Ordinary, 85 lbs. Fire, 100 lbs.

Financial—Cost, \$261,890. Debt, \$125,000: \$15,000 at 6, \$110,000 at 5%. Sinking fund, \$5,000. Ann. op. exp., \$12,000. Ann. rev.: consumers, \$29,630.

ZANESVILLE.—History—Built in '42 by town.

Water Supply—Muskingum river, pumping to reservoirs.

Pumping Machinery—Dy. cap., 8,000,000 galls.

Reservoirs—Cap., not given; two, 186x100 ft.,x17 ft. deep, and 180x200 ft.,x15 ft. deep, respectively. Of brick and stone, 185 ft. above river.

Distribution—Mains, c. i., 44 miles. Services, w. i., lead. Taps (in '87), 3,219. Meters, 3. Hydrants, 225.

Consumption, 2,831,900 galls. Pressure, 70 lbs.

Financial—Cost (in '87), \$517,473. Debt, \$310,000. Int., av., 4.23%. Ann. op. exp., \$19,016. Ann. rev.: consumers, \$31,054.

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APPENDIX I.

PROCEEDINGS

OF THE

NATIONAL CONFERENCE

OF

STATE BOARDS OF HEALTH,

AT THE

SEVENTH ANNUAL MEETING,

HELD IN

Washington, D. C., May 2nd and 4th, 1891.

PROCEEDINGS

OF THE

National Conference of State Boards of Health,

WASHINGTON, D. C., MAY 2nd and 4th, 1891.

The Seventh Annual Meeting of the National Conference of State Boards of Health was held at the Ebbitt House, Washington, D. C., May 2d and 4th, 1891.

The meeting was called to order at 10 A. M., Saturday, May 2d, by Dr. J. N. McCormack, President.

The following States were represented :

Alabama—Dr. Jerome Cochran.
Connecticut—Dr. C. A. Lindsley.
Illinois—Dr. John H. Rauch.
Indiana—Dr. C. N. Metcalf,
 Dr. S. S. Boots.
Iowa—Dr. J. C. Shrader.
Kentucky—Dr. J. N. McCormack,
 Dr. George Beeler.
Louisiana—Dr. S. R. Olliphant,
 Dr. L. F. Salomon.
Maryland—Dr. C. W. Chancellor.
Michigan—Dr. John Avery,
 Dr. Victor C. Vaughan.
Minnesota—Dr. P. H. Millard.
Missouri—Dr. George Homan.
New Hampshire—Dr. Irving A. Watson.
New York—Dr. Lewis Balch,
 Dr. O. Donohue.
Ohio—Dr. C. O. Probst
Pennsylvania—Dr. Benjamin Lee.
Rhode Island—Dr. Albert G. Sprague.
South Carolina—Dr. H. D. Frazer.
Tennessee—Dr. J. Bernien Lindsley.
Vermont—Dr. J. H. Hamilton.
West Virginia—Dr. N. D. Baker.
Wisconsin—Dr. J. T. Reeve.
Province of Ontario—Dr. P. H. Bryce.

The President: Gentlemen of the Conference, I have the pleasure of introducing to you Mr. Douglass, President of the Board of Commissioners of the District of Columbia.

Mr. Douglass made a pleasant address of welcome to the delegates, in which he referred to boards of health as boards of happiness, for their efforts are to promote the health of the community in order that every man may live out the full measure.

Washington, said he, is rapidly getting to be quite a scientific city by attrition and contact with the many scientific bodies that are making it their custom to meet in conventions here. This city has a new health ordinance compelling the placarding of houses where certain diseases are known to be.

At first this had almost caused a riot, but more recently a man had complained bitterly because his house was not placarded. This shows the progress of sanitary intelligence here. Feeling sure that their conference would result in the greatest good to the society and to the country at large Mr. Douglass again bade them welcome to the city.

The President: I have heard with pleasure the kind things Mr. Douglass has said. This is one of a number of meetings we have held in this city. We represent the official state organizations in our respective States. The growth of state board of health work has been very rapid. As you know, the first Board was organized in 1869; now there are thirty-two State Boards of Health in the Union, and measures are pending looking to the establishment of similar organizations in the other States.

The Secretary: I have an explanation and apology to make in regard to announcing the local committee of arrangements, to whom we are very much indebted. Dr. Townshend, the District Health Officer, very kindly consented to arrange for this committee, but on account of the Doctor's illness, the matter was delayed until after our programme was issued. The local committee are, Dr. Philip S. Wales, Dr. C. H. Demerest, Dr. Poole and J. C. McGinn, the Deputy Health Officer.

The President: Dr. Brice, of Toronto, telegraphs asking me to announce that it is impossible for him to get here until this afternoon, and requesting the postponement of the discussion of the first and second questions in which he is interested.

The first question for discussion will be the one proposed by the State Board of Health, of Louisiana:

1. What are the requisites for a thorough system of quarantine and maritime sanitation in the light of present scientific attainment?
2. What are the best methods for the self-protection of individual States from the introduction of pestilence through States which have no adequate quarantine?

And in connection with this, the question proposed by the State Board of Health of Alabama:

1. Given a vessel with cargo from Central or South America, or the West India Islands, can such vessel and cargo be disinfected without discharging the cargo?
2. Can such cargo be disinfected thoroughly, and without damage, after it has been discharged?

The discussion of these questions will be opened by Dr. Jerome Cochran, of Alabama.

QUARANTINE REQUISITES.

BY DR. JEROME COCHRAN, STATE HEALTH OFFICER OF ALABAMA.

I have undertaken to open the discussion on one of the questions submitted by the Louisiana State Board of Health, namely: What are the requisites for a thorough system of quarantine and maritime sanitation in the light of present scientific attainment? In accordance with the limitations of my own personal and experimental knowledge, I shall confine the discussion to a consideration of the best means for the protection of our gulf ports from invasion by yellow fever by way of the sea.

THE SOURCES OF OUR YELLOW FEVER EPIDEMICS.

Yellow fever epidemics have prevailed within the territorial limits of the United States since the Columbian discovery of America, in ninety-three different years. In eighty-one of these years we have had some evidence as to the sources whence it was derived, namely: from the West Indies seventy-five (75); from Mexico four (4) times; from Demerara, twice (2); from Honduras, once (1); and from Rio de Janeiro, once (1).

From these statements it follows that the great sources of danger to us are the West India Islands; and amongst these islands, the single island of Cuba, and the single city of Havana have furnished us with the immense majority of our epidemics. I could give you the reasons why Havana is so exceptionally dangerous, but it would take too much time to undertake to do so on the present occasion.

The yellow fever which is brought us from Havana and other foreign ports is necessarily brought to us in water crafts of various kinds, all of which we may speak of for convenience as ships, and as an incidental consequence of our foreign commerce.

If we could prevent the infection of ships at the foreign port, say for example, at Havana, that would be the best possible solution of the problem of protection. We can not always do this with certainty; but we can do it even now to a considerable extent; and it is to be hoped that we will be able to accomplish more in this direction in the near future. It is certainly true, and I desire to call very emphatic attention to the statement, that the immense majority of the ships coming to us from Havana during the season of the year when yellow fever is most prevalent there, are entirely free from infection, and hence, also, entirely free from danger. While this is a fact of great practical importance, it is one that seems to have attracted very little discussion, and it is therefore difficult to indicate what proportion of the whole number this majority actually is. From such data as I have been able myself to collect, I am well satisfied that of ships coming into the Gulf of Mexico from the West India ports in epidemic seasons, not more than one in twenty at the most is really infected, while in non-epidemic seasons the proportion is less than one to the hundred. I suppose that to many who have had much experience in quarantine work, this statement will seem altogether incredible. It is nevertheless, beyond all question, substantially true; and it is very easy to see that its thorough going recognition will materially influence the current practice of quarantine.

This comparative immunity of ships from Havana from the infection of yellow fever has been obtained for many years, and in the absence of any special effort to secure it. Of late years, however, we have had agents in Havana, and some other ports, whose official duty it has been to inspect and certify to the sanitary condition and sanitary history of ships coming to this country. I regard this system of sanitary supervision of ships at the port of departure as extremely important, and as admitting of large development. Indeed, I do not think that it is altogether visionary to forecast the time when the principal quarantine station for the protection of our gulf ports will be not at New Orleans or Mobile, but in the harbor of Havana.

As we have seen the chances are many to one that any designated ship in the harbor of Havana will escape infection any how, without any special care being taken to that end. But it is possible to take a great deal of care to secure this immunity from infection, and with very great probability that such care will be rewarded with a very large measure of success.

The plan, in this regard, pursued for several years by the Plant line of steamers, running between Havana and Pampa, may be taken as a sample of this sort of work. These steamers are of iron, they have no bilges, and it is easy to keep them scrupulously clean. They go into the harbor of Havana after sun up in the morning, and leave it before sunset in the evening. They do not lie along side of the wharf, but tie up to a buoy out in the bay. Only a single acclimated officer is allowed to go ashore, and only into the business part of the city, where yellow fever is not apt to be found. And no suspicious passengers or freight are allowed to be shipped.

I do not undertake to say that these precautions guarantee complete immunity against infection. I know of no precautions of which that can be said. But I believe such precautions are of very great practical value, and more likely to keep a ship free from infection than the usual treatment at our quarantine stations is to make an infected ship safe again.

PRINCIPLES OF DISINFECTION.

Disinfectants, for the purposes of this argument, may be briefly defined as agents which destroy, or render innocuous, the zymotic poisons which generate epidemic diseases.

Or, inasmuch as these zymotic poisons are universally held to be associated with the action of living germs, disinfectants, from another point of view, are such agents as destroy the vitality of disease germs.

It is extremely probable that the real toxic agent in the production of yellow fever is either a ptomaine, or a toxalbumin. But it is also extremely probable that human creatures very rarely receive this poisonous ptomaine, or toxalbumin in sufficient doses to produce an outbreak of the fever, except when it is generated within the system itself by the action of the living germ on some of the tissues or fluids of the body. At any rate, the practice of disinfection is based on the assumption that any agent which will kill the germs which generate the disease poisons will prevent the generation of the disease itself. Hence we may say, very briefly, that disinfectants are germicides.

The principal agents of disinfection are: (1) extreme cold; (2) extreme heat; (3) various chemical reagents; (4) cleanliness and ventilation.

The influence of heat and cold upon living creatures, and especially upon microscopic organisms and disease germs, is not at all uniform. Fritsch has shown that certain bacteridia in the micrococcus stage retain their vitality after congelation with carbon dioxide, that is to say, at a temperature of 70° below the zero of Fahrenheit's scale, or 102° below the freezing point of water. On the other hand, Dallinger and Drysdale have shown that the germs of certain monads are able to survive a temperature of 300° above Fahrenheit's zero, or 88° above the boiling point of water. In the mean time, fully developed bacteria and fully developed monads are destroyed, as a rule, at a temperature far below the boiling of water, namely, at 140° Fahrenheit.

Of the morbid poisons which generate human pestilences very few have been subjected to direct experimental observation in regard to their capacity to withstand elevations and depressions of temperature; but it is generally accepted as well established that the heat of boiling water is sufficient to destroy the malignant energy of most of the septic germs generated in the human bodies, such as the poisons of pyæmia, septicæmia, gonorrhœa, syphilis, etc. The contagium of vaccinia and the contagium of small-pox are also destroyed at the temperature of boiling water, and this temperature seems to be destructive of the germs of cholera and of typhoid fever. The limits of the resistance of the zymotic poisons to cold have not been much studied, and our knowledge in this direc-

tion is still very defective. It is known, however, that vaccinia and small-pox survive very great reductions of temperature. Small-pox, indeed, seems to be specially a disease of cold climates and of cold seasons of the year: and is hardly able to maintain itself at all against the protracted summers of our gulf ports. On the other hand, yellow fever is notoriously a disease of warm climates and warm seasons of the year; and the most dreadful epidemics are promptly checked by the advent of frost and winter weather. In the face of this broad fact, which is sustained by the unanimous testimony of many hundreds of epidemics, it is hardly possible not to believe that the yellow fever poison, or the yellow fever germ, can be destroyed by cold: and if it can be destroyed by the natural cold of very mild winters, it would seem to follow that it can be destroyed, also, by cold artificially produced. The cases, so much discussed, of the Susquehanna and the Plymouth, have thrown some shadows of doubt across the minds of many sanitarians as to the soundness and universality of this conclusion. It seems to me, however, that it is more reasonable to believe that there is some undiscovered fallacy in these cases, than it is to believe that the uniform experience of centuries has in this matter led the whole world astray.

While the yellow fever poison is thus sensitive to cold and intolerant of frost, and while it flourishes most in tropical countries and in summer weather, experience warrants the statement that very high temperatures are just as fatal to it as very low ones. It is very safe to say that it is not able to withstand either wet heat or dry heat at 250° Fahrenheit; and the heat of boiling water, 212°, is probably quite sufficient for its destruction.

The list of chemical disinfectants is quite a long one, but for quarantine purposes it is only necessary to mention two of them, namely, sulphur dioxide and mercury bi-chloride.

Sulphur fumigation is one of the most ancient methods of disinfection. It was employed by the much planning divine Ulysses, a thousand years before the beginning of our Christian era, to purify the hall of his palace, at Ithaca, which had been made foul by the carcasses of the slain suitors of the prudent Penelope. The disinfecting power of sulphur fumes has been called in question of late years, but the range and limits of its application are now, thanks to the labors of the committee on disinfectants of the American Public Health Association, quite accurately defined. Mixed with atmospheric air to the extent of one or two volumes per centum it destroys the vitality of vaccine virus. I think there can be no doubt of its efficacy against the poisons of measles, small pox, and scarlet fever; but I would like to use it in atmospheric mixtures of much greater strength than one or two per centum—say from five to fifteen volumes per centum. In brief, it is probably fatal, when properly used against all non-spore bearing bacilli, while it can not be depended upon for the destruction of the spores of the pathogenic bacilli, such as those of anthrax and malignant oedema. The presumption is that the germ of yellow fever does not produce spores, and that the sulphur dioxide is competent to effect its destruction. The sulphur strength of the atmospheric admixture, and the length of exposure necessary to this end we do not know; and in the absence of such knowledge prudence dictates that the sulphur dioxide should be used in abundant quantities, and that the exposure should be protracted.

Of mercury bi-chloride I need say very little. Its germicidal power is very energetic, except the presence of albumen, and its use is not attended with any special difficulty.

The importance of cleanliness and ventilation is so generally recognized that I need do no more than to mention them.

QUARANTINE OUTFITS.

In order to determine what sort of a quarantine establishment is needed for the protection of any of our gulf ports it is necessary that we should know approximately a good deal about the commerce of the port in question; such details, for example, as these that follow:

- (1.) The number of vessels coming into the port during the quarantine season from ports infected with yellow fever and especially from Cuban ports so infected.
- (2.) The number of such vessels constructed of wood, and the number constructed of iron, and whether sailers or steamers.
- (3.) How many come with cargoes, and the nature of such cargoes.
- (4.) How many come in ballast, and the nature of such ballast, whether rock ballast, or sand ballast, or water ballast, or ballast of some other sort.
- (5.) How many of the ships bring passengers; and how many passengers, and what sort of passengers; whether acclimated or unacclimated, and whether cabin or steerage passengers.

The sort of information here indicated can be always easily obtained; and it is easy to see that the quarantine requirements of a port in which the arrivals of ships during the quarantine season amount to several hundred would need to be projected on a very different scale from the quarantine requirements of a port in which the arrivals number only a few dozen. Wooden ships, under sail, in ballast, without cargoes, with acclimated crews, and without passengers, such as frequent so many of our gulf ports to take away lumber and naval stores, require very different treatment from iron steamers, with valuable cargoes, and numerous unacclimated passengers.

From another point of view, ships may be divided for quarantine purposes into those coming from infected ports, indeed, but with clean bills of health and no history of infection, and in regard to which the presumption is that they are not dangerous; and those without clean bills of health, or with a history of epidemic disease during the voyage, or which for some reason are vehemently suspected of infection; and these two classes of ships require very different treatment.

In regard to ships of the first class there is twenty, thirty, forty to one, that they are free from danger. Nevertheless it is considered to be expedient to disinfect them with more or less care, with the hope of providing against all contingencies and of rendering safe the very small percentage that in spite of appearances may, perchance, be the carriers of infection. The large majority of our quarantine stations are intended to deal exclusively with this class of vessels.

Ships of the second class, those that are known to be infected, or that are vehemently suspected to be infected, are treated with much more rigor, and for them separate stations have been constructed, where an abundance of time is taken, and all the resources of disinfection are exhausted in the effort to make them safe again before they are restored to commerce.

There is only one port on the gulf coast where this dangerous class of vessels is treated by the local quarantine authorities, and that is New Orleans, which city has two separate quarantine stations near the mouth of the Mississippi river, one for the treatment of vessels belonging to the first class, and one for the treatment of vessels of the second class. Pensacola, Mobile, and other smaller gulf ports send ships of the second class to the national quarantine station at Chandeleur.

For convenience we call these two classes of quarantine stations, respectively, inspection stations and refuge stations. I may be pardoned here for recalling attention to the fact that the establishment of refuge stations grew out of a recommendation made by me to the National Board of Health in 1879. The outfit of a refuge station need not differ much from the outfit of an inspection station, except in the provision of hospitals and ware-houses; but it would astonish any one, but a quarantine expert, to know how very small is the extent of hospital and warehouse accommodation that is needed at a gulf refuge station. At an inspection station, of course, the need is still less, and most inspection stations in the gulf can get along very well without any provision in the way of hospitals or ware-houses either.

The inspection station takes charge of ships that are presumed not to be dangerous, and the aim of such stations is to treat these ships in such a way as not to occasion any

considerable delay, and as not to involve any very great cost in such a way; in other words, as not to throw too much embarrassment in the way of commerce. I do not hesitate to assert that a quarantine detention of ten days at any gulf port would act as an absolute embargo on the commerce of such port, with all tropical countries, subject to yellow fever; and I will assert further that a detention of five days at quarantine is more than our West India commerce and travel can very well bear. For Havana steamers any detention of more than a few hours is found to be burdensome. The disinfecting work at our inspection station must be done speedily. At the refuge stations the period of detention may be as extended as you please, in the case of the sick, until their recovery in the case of the ship and its cargo whatever time may be considered necessary for their purification. If the ship is empty, all that is possible in the way of disinfection can be accomplished in a few days. If there is a cargo to be treated then the character of the cargo has to be taken into account. In the meantime there is no theoretical reason why a ship should not be disinfected as speedily at a refuge station as at an inspection station. If the methods employed at the inspection station quarantine the subsequent immunity of the ship from danger, why should not the same methods secure such immunity under all circumstances? Still the practice is as I have stated it to be.

In projecting a scheme of quarantine, the first problem to be settled is whether the disinfecting apparatus shall be carried to the ship at some convenient anchorage, or whether the ship shall be brought to some wharf where the disinfecting apparatus is stationed. A few years ago the rule was to treat the ship at the quarantine anchorage. The rule now is, since the introduction of what is commonly called the improved quarantine system, to bring the ship to the quarantine wharf.

The agents of disinfection are the same in both systems, namely: (1.) Ventilation. (2.) Cleanliness. (3.) Sulphur fumigation. (4.) Flooding with mercury bi-chloride solution. (5.) The application of dry and wet heat. These agents are applied to the disinfection of the ship, to the disinfection of the ballast, to the disinfection of the cargoes, and to the disinfection of the baggage and bedding of the passengers and crews. It is necessary to make a few remarks under each of these heads.

(1.) The disinfection of an iron steamer, without bilges and without cargo, can probably be accomplished with tolerable certainty by sulphur fumigation and flooding with the mercury bi-chloride solution. If we have to deal with a wooden ship with two skins, foul bilges and sodden timbers, the problem is much more difficult, and it has been generally believed the foul bilges themselves are apt to become infected, we are warranted in doubting whether the disinfection can be successfully accomplished at all, unless the inner skin is removed and the accumulations of filth in the bilges removed by scraping. I have known yellow fever to break out again in a few days in a ship of this sort where great labor had been expended in the effort to make her safe.

(2.) Very few outbreaks of yellow fever have been traced to infected ballast; but cases enough have occurred to render the ballast suspicious. Clean rock ballast might, perhaps, admit of disinfection without removal from the hold of the vessel. But when dirt ballast is encountered, packed hard for a depth of several feet, prudence would require its removal. This is not always so simple a thing as many might imagine. The ballast is necessary to preserve the stability of the ship in the water. It can not be removed safely while the ship is at anchor, and if foul ballast is removed other ballast must be put in its place. With water ballast the problem is, of course, easy.

(3.) I think in the large majority of the cases we have to deal with the disinfection of cargoes without removal from the ship is impracticable. For any effort in this direction we would have to depend almost exclusively on the sulphur fumigation, and I doubt if it could be efficiently applied. It is hardly worth while to inquire whether cargoes can be successfully disinfected after removal from the ship, because any such practice as this would require so much time and so much expense that commerce would not submit to it. Fortunately cargoes are very rarely infected.

(4.) Baggage and bedding are the most dangerous of all fomites that come to us in

ships. It is therefore fortunate that their disinfection is comparatively easy. The rough baggage of crews can be boiled in simple water, or in bi-chloride solution, and subjected to fumigation. The finer fabrics, belonging to the better class of passengers, are a little more difficult to deal with, because they are liable to suffer serious damage if subjected to any of the methods suggested. It is in regard to this class of goods, that the use of dry heat in the steam cylinder may be employed. But even this method sometimes does considerable damage. Besides, when large quantities of baggage in piles and bundles are treated in the cylinder, the heat is not always sufficient to guarantee the destruction of all the disease germs. I suppose a good many of those who hear me have been surprised that all I have so far said about the improved quarantine methods, so much talked about of late years, has been an incidental allusion. I have not cared to discuss at length these improved methods because I believe their value as compared with the older methods has been greatly exaggerated. The same identical agents of disinfection are employed in the old system that are employed in the new, and the only important consideration is that their application shall be as thorough as possible. I am sure that the atmosphere of a ship's hold can be impregnated with just as large a percentage of sulphur dioxide by the old method of burning the sulphur in pans, as by the new method of burning it in the furnaces outside of the ship, and it does not take any more time. I am sure that the holds and decks of ships can be just as thoroughly deluged with the mercury bi-chloride solution by the use of tubs and buckets as by the use of an elevated cistern and a hose pipe. And I am sure that all rough textile fabrics can be as completely disinfected by thorough boiling in common water, or after soaking in the solution of the mercury bi-chloride as in the steam cylinder. It is only in the treatment of the finer fabrics, as already explained, that the steam cylinder plays a part of special importance.

Nevertheless, I would favor the adoption of the newer methods by all ports that are able to bear the expense. They are more elegant, more convenient, and impress to a much greater extent than the old ones, the imagination of every body concerned.

The President: The discussion will be continued by Dr. Olliphant, President of the State Board of Health of Louisiana.

Dr. Olliphant: MR. PRESIDENT AND GENTLEMEN:—The discussion which I have been selected to open is on the interesting question proposed by the State Board of Health of Alabama:

First. Given a vessel with cargo from Central or South American ports, or the West India Islands: Can such vessel and cargo be disinfected without discharging the cargo?

Second. Can such cargo be disinfected thoroughly, and without damage, after it has been discharged?

The subject matter of these questions is so intimately connected with the first question submitted by the State Board of Health of Louisiana, that in discussing the former, it is impossible to avoid entering very fully into a description of what the Board of Health of Louisiana believes to be at least part of the "requisites for a thorough system of quarantine and maritime sanitation in the light of present scientific attainment." The gentlemen who have been so happily chosen to open the discussion of the questions submitted by the Board of Health I have the honor to represent, will certainly appreciate this necessity, and understand that there was no intention to attempt to create prejudice for or against their views on the subject.

New Orleans may, without presumption, be said to be the port in this country that has afforded the greatest practical experience in the disinfection of vessels and cargoes from dangerous points in the countries named in the first question, and it was doubtless, with the intention of eliciting information as to the results of this experience, that one of the representatives of the State of Louisiana was chosen to open the discussion.

It is almost superfluous to state that I am here to sustain the affirmative side of the discussion; at any rate, as far as the first question goes. It is a matter of almost daily occurrence every summer for vessels with cargoes from the countries named to be disinfected at the Quarantine Station on the Mississippi river without discharging any part of the cargoes, and without damage to the vessels or the goods they carry.

It is true that when the State Board of Health of Louisiana, under the able lead of my predecessor, Dr. Joseph Holt, undertook to replace by a system of scientific and efficient disinfection the old brutal and haphazard quarantine methods that still prevail even to-day in many alleged civilized countries and communities, mistakes were made that resulted in more or less damage to the vessels and cargoes, but this was almost inevitable under the circumstances, and in few cases did the damage reach important proportions.

The danger of damage being done in the process of disinfection is now practically nil, and does not need to be considered in connection with the system under which we operate.

Of course a certain class of cargoes *can not* be disinfected by any known process whatever without utter destruction to the articles handled, but the only cargoes of this nature that we find coming from the countries under discussion are bananas, pine-apples, oranges, limes, etc., and it seems to be conceded that while the vessels carrying these fruits may bring in disease, the fruits themselves are not to be dreaded as possible germ conveyors.

The cargoes from the countries named in the questions, that are looked on as probable germ carriers, and that can be thoroughly disinfected on board of ship without damage, consists of coffee, sugar, tobacco, woods, rubber, hides, bone, etc., and in some cases the vessels have baled, boxed and other goods loaded in Europe and carried around by way of the West Indies and Central America, that naturally come in contact, more or less, with the articles taken on board at the dangerous points visited on the way.

This is the class of cargo that is presumably referred to in the questions propounded, and I state, as a fact, that we can and do disinfect vessels and cargoes of this description at the Mississippi River Quarantine Station without discharging any of the goods, and without damage to ship or cargo.

It is true that we land the clothing and bedding of the crews and passengers, and all the movable textile fabrics on board the ships, and treat these articles on shore, but they can not properly be classed with the cargo, and the handling of them is accomplished with very little extra expense and probably no extra delay. In fact, with proper appliances and thorough system, the disinfection of the articles so landed can be carried on simultaneously with the treatment of the vessel and cargo.

We have every reason to believe that our disinfection now is thorough in every detail, but it is not possible to make this assertion with absolute certainty.

It will doubtless be conceded that the clothing and bedding of the crews and passengers are the most dangerous character of fomites. It will therefore be appropriate to consider in the first place the process of disinfection which these articles are subjected to.

Heat efficiently applied is universally recognized as the disinfectant par excellence.

It is to this agent that we have recourse in treating the clothing and bedding, etc., from vessels that come within the scope of the questions under discussion.

The articles to be disinfected are hung on racks suspended inside large iron cylinders, through which run numerous coils of pipes which convey from a steel boiler the heat necessary to raise the temperature in the cylinders to 210° F. of dry heat, when steam is allowed to rush direct into the cylinders, rapidly raising the temperature to 230° F. of moist heat, at which figure it is kept for at least half an hour with pressure on the cylinders of about seven pounds to the square inch.

I call special attention to this statement because Dr. Cochran doubted very much whether or not the heat permeated thoroughly the articles subjected to it.

Dr. Cochran. I had in mind especially the experiments made by Dr. Kinyoun. You say seven pounds to the square inch. Do you mean seven pounds above the fifteen pounds?

Dr. Olliphant: We have valves connected with this cylinder that blow off at seven pounds pressure in excess of the fifteen pounds normal air pressure.

The articles are thus subjected to a heat of from 210° to 230° F. for a total period of nearly one hour, and it is found by actual experiment that under this pressure thermometers imbedded in the center of pillows and mattresses indicate the same temperature as that of the cylinders, proving conclusively that the heat penetrates thoroughly all articles exposed to its action.

Some years ago the U. S. Marine Hosp. Service, upon invitation of the Louisiana State board of health, commissioned Dr. Kinyoun to investigate and report upon the efficiency of maritime sanitation as practiced at the Mississippi Station at that time. Although the means of application were then far inferior to the present arrangements, Dr. Kinyoun's report showed that this step in our methods of disinfection was very certain in action, and destructive to most germs that were submitted to this test.

If then it was so very effective at that time, we are justified, with our improved appliances, in claiming to-day absolute efficiency, and believe, were Dr. Kinyoun's experiments now repeated, the result would justify the claim.

[In support, see page 267, Reports and Papers of the American Public Health Association, Vol. 11, in which Dr. Sternberg states that steam at a temperature of 230° F. maintained for a period of one or two minutes, or of 222° F. maintained for ten minutes, will infallibly destroy the spores of bacilli which constitute the most difficult test of disinfecting power known.]

At the same time that this heat disinfection is being applied a force of men is engaged with mercuric chloride solution in washing down decks and cabins, and sprinkling all articles that would be damaged by heat disinfection. This solution is made of a strength of 1 to 1,000. There is no special skill required in its application, care as to thoroughness being the main point to be considered. This solution is contained in a tank of about 7 or 8,000 gallons capacity, placed at an elevation of about forty-five feet. The tank is connected with pipes leading along the wharf. By means of a rubber hose with nozzle and spray attachments, a stream of the solution can be conducted and thoroughly applied to any and all parts of a ship.

As this process of disinfection is claimed to be efficient, we will now consider the last step—i. e., the fumigation of a ship's hold and cargo with sulphur di-oxide.

It is apparent, if reference is made to the report of Dr. Kinyoun, that his experiments were not very flattering to this process as practiced at that time. But with the improvements made since then, we believe this portion of our service has been made to equal if not excel the efficacy of our other methods.

Formerly the SO_2 generated was obtained by the combination resulting from the voluntary combustion of the sulphur in a furnace to which oxygen was admitted in unlimited quantity.

Dr. Cochran in his paper made the statement that the old methods—I do not refer specially to methods immediately preceding the present system—suffice for the purpose of saturating the hold of a ship with SO_2 gas as well as any that have been devised since.

It is a well known fact that combustion can not take place in an atmosphere with one-half its oxygen replaced by SO_2 —such an atmosphere would extinguish combustion. That being the case, it can readily be seen that by former methods a 10% gas was the highest possible attainment. As a matter of fact, tests showed from 4 to 8% in our former system which is claimed to be superior to the pot system. With this weak gas introduced into the large volume of air contained in the hold of a ship, it can readily be

imagined to what degree of dilution it would be subjected, and what length of time would be required to replace or saturate the ship's air by pouring this weak gas into it.

I am asked by what authority I make the statement that an atmosphere containing 10% of SO_2 will extinguish combustion.

If the Doctor will allow me, probably I would as well make the statement now as on the completion of this paper—I give Dr. Albrecht as my authority and the following test in corroboration:

On the completion of our new furnace I was naturally solicitous, considering the short lead of pipe to hold of ship, as to whether or not we ran risk of setting fire to a vessel. Dr. Albrecht assured me of the impossibility of combustion in an atmosphere with one-half its oxygen replaced by SO_2 gas. Having tested the gas and knowing it to be stronger than 10%, we made the following experiment: A hogshead filled with shavings saturated with coal oil was set on fire and the gas played on it. The voluminous flames were almost instantly extinguished. On examination afterwards it was found that even the oil on the shavings had not been consumed. This proved conclusively to my mind the statement made by Dr. Albrecht.

With the improved apparatus now in use, we consume almost all the oxygen in the air supplied to the furnace, and generate a gas of from 15 to 20% strength. We also favor the displacement of the air contained in a ship's hold by introducing this gas, twice as heavy as the atmosphere, into the bottom of the ship and at the same time exhausting the foul air contained in the ship through a pipe connecting with and tapping the ship's hold almost flush with the deck. By this means we lessen the dilution of our SO_2 gas and favor the displacement of the atmosphere; at the same time we are passing this supposed infected air over our heated sulphur in the furnace at a temperature of about 600 F., literally consuming all organic matter, and converting almost the entire oxygen into sulphur di-oxide. Certainly the atmosphere passed through the furnace is most thoroughly disinfected, both by heat and SO_2 , and we believe by the length of time devoted to a ship's hold, that most, if not all the air contained therein, has passed through this ordeal.

Any particles of contaminated air that may possibly have escaped the force of our suction current from the ship, we believe will be relieved of all living organisms by its oxygen being materially diminished and replaced with the deadly SO_2 gas; practically an atmosphere permeated with SO_2 to the extent of 10% is considered germicidal. With our present apparatus we are confident we easily obtain that degree and even stronger.

Our apparatus consists of a boiler-like cylinder containing one or more pans, arranged one above the other with air spaces connecting them alternately at the front and back, whereby the air is made to pass over the contents of all the pans. Underneath the cylinder is a furnace arranged in the same manner as for steam boilers, with ash pan, etc., which furnace serves to keep the sulphur in the first pan in a molten state and the heat from this pan melts the sulphur in the pan above. An air-tight pipe from the hold of the vessel to be fumigated, is connected with the furnace immediately over the surface of the bottom pan to supply oxygen for the generation of the sulphur di-oxide. This pipe is provided with a cock for obtaining samples of the air, and a valve for regulating its supply to the furnace. An eleven-inch discharge-pipe taps the furnace at the top, curving over, leads down into and within six inches of the bottom of a reservoir. From the reservoir the gas is drawn by a "Sturtevant Fan" through an 8-inch pipe, issuing from the side of the reservoir, but having a curved section on the inside reaching nearly to the top, and is forced through a lead of pipe, extending through the roof of the tug to the pilot-house, and thence to the bottom of the ship's hold. It will thus be seen that, as the gas entering the reservoir is lead nearly to the bottom of the reservoir and having to leave again through the curved section of pipe near the top, the direct current is broken and any particles of burning sulphur that may enter are apt to be lodged at the bottom. The difference of size of pipe of entrance and exit is made with a view of having a slow current in and from the furnace to the reservoir through the fan; this result naturally fol

lowing as the same amount of gas must necessarily leave the reservoir through the small pipe as comes in through the large pipe, thereby allowing longer contact of the air with the surface of the sulphur.

You will observe we now have a connection between the compartment to be disinfected and the furnace, by which we can keep up a continuous current without the admission of any air from the outside world. After charging the pans with sulphur, the furnace is closed and the fire started in the box underneath. In a few minutes the sulphur is in a molten state—not burning, because it has no oxygen supply; then the fan is started driving a current from the reservoir into the hold and producing a return current in second pipe from the hold to the furnace. We now have the apparatus in full operation, drawing the foul and infected air from the ship's hold into the furnace, literally burning it and converting its oxygen into SO_2 , and sending this deadly gas to the bottom of the ship.

I believe with the above appliances ships with the ordinary cargoes can be and have been thoroughly disinfected without discharging cargoes. Cargoes thus disinfected in the hold of a ship can be similarly treated when removed to a compartment specially prepared for the purpose, but this procedure would entail extra time, labor and expense, and not render the service any more efficient.

From a practicable stand-point one can conceive of particular kinds of cargoes, rags, baled goods, etc., that would not be thoroughly disinfected by the methods mentioned. Even these could be disinfected by proper exposure to our agents, but as such exposure would not be practicable, this class of goods is not brought to our port in quarantine season from the countries named in the questions under discussion.

I think Dr. Cochran did not understand one or two statements in my paper—one of which is in regard to the generation of the sulphur gas. The doctor makes a statement that according to my own paper I would have to admit that we could only generate a gas of ten per cent.

Dr. Cochran: Undoubtedly if you draw the air out from the hold of the ship.

Dr. Olliphant: If the doctor will understand, my original statement was that an SO_2 gas can not be made stronger than 10 per cent. by burning sulphur in the atmosphere. We do not claim to generate this gas in that manner. The sulphur is kept in a molten state by a fire underneath the pan, and oxygen or air is supplied simply for chemical combination.

Surely, sulphur in a molten state is in the most favorable condition for chemical union with oxygen, and it is believed that a supply of air properly regulated will be deprived of nearly all its oxygen, which latter is converted into SO_2 gas. As a matter of fact, we have by actual test obtained a gas of 18 per cent.

Dr. Cochran also expresses his doubts, in the absence of facts, as to whether this gas, let down into the ship at one point, would permeate the whole ship.

All large ships are divided into compartments, and each compartment is fumigated.

Dr. Holt, with a view to removing just such doubts, placed vessels containing water at the most remotest point from the entrance of the gas in the hold of a ship loaded with coffee, covering these vessels with sacks of

coffee, and after the completion of the fumigation this water, on examination, proved to be strongly impregnated with sulphur. I propose making further experiments the coming summer.

As to the impracticability of thoroughly disinfecting baled goods, I agree with the doctor fully, but it is to be remembered, as I stated in my paper, no such goods are shipped from intertropical ports to our port during quarantine season.

As to the damage done to textile fabrics in heat disinfection I will state, that the most delicate silks and laces have been subjected to this process without being injured in the least.

Regarding the question of ballast I will state that our Board, recognizing the impossibility of disinfecting earth-ballast, has prohibited the bringing of such ballast from infected ports.

Dr. Salomon: Mr. President and members of the Conference:—I have been requested by Dr. Olliphant to continue the discussion of this subject, and will ask your attention for a few moments:

The question as to what constitutes a thoroughly efficient system of quarantine, offering the greatest assurance to seaports subject to invasion of epidemic disease through their commercial relations with infected foreign ports, having been discussed, and it being admitted that the methods in operation in Louisiana meet the requirements and guarantee a reasonably certain protection, it necessarily follows without argument, that seaport towns not pursuing such methods while allowing intercourse with infected places, not only do not protect themselves, but expose other and adjoining states to the liability of invasion by disease.

The liability may be remote, it is true, still it exists, and existing, it becomes a matter of serious consideration what measures should be adopted by the several states to protect themselves without causing conflict and disagreement, which never result in good.

It is to be regretted that no successful effort has yet been made to solve this problem of self-protection; and it is with this object in view that the question has been propounded, in the hope that this Conference will be able to arrive at a conclusion whereby all interested states will be able, through their duly constituted health authorities, to act in harmony, by means of a common understanding as to the needs of each.

It is not our intention to reflect upon the good faith or proper vigilance of any particular State; and while granting to each the right to act as it sees fit in the matter of quarantine protection, and the adoption of whatever measures may be selected, and by it considered adequate to meet the needs of proper sanitary protection, we still claim the same right of refusing to recognize such methods as offering a guarantee of protection if the system in vogue does not meet all the conditions considered essential to a thorough, efficient and modern quarantine service, or system of maritime sanitation at ports of arrival.

In the exercise of that right, therefore, it necessarily follows that we seek for the best means of preventing the introduction of pestilential disease through other ports, when our own ports are provided with what we deem adequate methods of protection, and while so doing, leave without question to each State to provide its own methods of quarantine; but, say that others should not be the means of inflicting us.

We of the State of Louisiana, foremost in the matter of quarantine improvement believe, with our complete methods of fumigation and disinfection of vessels, cargoes,

baggage and ships' effects, coupled with a reasonable period of detention of passengers and crews after the work of sanitation is completed, that we provide all that can be done in the way of keeping out pestilence; and if the health authorities of other States do not deem this sufficient for their protection from invasion *through* Louisiana, it is their duty to protest; and, failing to secure a better guarantee of safety, to adopt such measures as become necessary to defend themselves.

We claim the same privilege.

For several years after the epidemic of 1878, which scourged the Mississippi Valley and which found its way to this country through New Orleans, the other states exposed to the direct danger of another visitation expressed their want of confidence in the efficacy of the methods then in vogue in Louisiana, and adopted such measures as they thought best for self-protection.

This want of confidence and a desire for greater assurance of safety gave rise to the National Board of Health, through whose officers and inspectors such measures were instituted as satisfied the doubts of complaining States, and through traffic went on uninterruptedly.

But for reasons which it is unnecessary to mention at this date, Congress deemed it wise to take away the powers of said Board and leave to each State its own methods of protection.

I refer to this, not for the purpose of reviving any of the former arguments either for or against the National Board, but only to direct attention to the fact that, Louisiana at one time showing itself derelict, other States sought and found means which at the time satisfied them to a reasonable extent.

The same conditions as then existed at all the Gulf ports, exist to-day as to some of the ports on the Atlantic and the Gulf of Mexico. A few have, at an enormous expenditure of money and incessant effort at improvement, provided themselves with quarantine disinfecting plants of modern construction; some, during the danger period maintain strict non-intercourse, while others offer no protection at all or their methods are inadequate; and it is as to our relations with these two latter that we are particularly interested and ask the deliberations of this Conference as to what is the best course to pursue.

We claim that such ports should not be allowed to give free entrance to either freight, baggage or persons whereby the least risk of infection is incurred, as it is in such through traffic that great danger lies, and against which we protest.

While Louisiana with its efficient quarantine system and untiring vigilance is seeking to protect itself through its own ports of entry, it is ever anxious lest through other ports it may be visited with yellow fever from Havana or small-pox from Mexico. And if we are to be exposed in such manner, where, I may ask, is the necessity of our own methods with their delay and consequent cost to commerce.

While imposing a detention on shipping after thorough disinfection, said detention being for observation, and thus providing a time for allowing the development of disease before giving a vessel *pratique*, we seriously and emphatically protest against a person being allowed to come to New Orleans from Havana in less time than that occupied in undergoing surveillance at our quarantine station when coming direct.

It is with the greatest gratification that we learn of the recent improvements in the quarantine service at Tampa, Fla., but Tampa is one of many ports of entry in the vast peninsula of Florida and through many of these ports, passengers with their baggage, can and do come to New Orleans within three or four days of the time of leaving Havana; and it should be the duty of the Board of Health of that State to provide the necessary safe-guards against the introduction of disease.

True, an effort is being made in this direction. A boat has been put in service to patrol the coast, and this will, to some extent, prevent illicit intercourse, but not entirely so, and therein lies our source of danger.

Another, and what we consider a more serious source of danger, and one against which Louisiana has protested, is the inadequate system at Tampa. It is a matter of history that persons, for the purpose of evading detention at the Mississippi River Quarantine Station, have taken ship at Havana, landed at Tampa, and come through to New Orleans in three days or a little over. True, they were admitted upon certificates from the health officer at Havana and their baggage disinfected, but we claim that there is not only a possibility, but a probability, that the health officer can be deceived as to the acclimatization of such persons, with the risk of attending results.

Again, persons destined for points north of latitude, $38^{\circ} 54'$, can go from Havana to Tampa without further question than as to their apparent destination, and with their baggage coming from a probably infected quarter, go through without detention or disinfection, and proceed, if they so will, to Mobile, Memphis, New Orleans, or other points, open such baggage in some boarding house, hotel, or private residence, and thus expose the community to the liability of infection of yellow fever.

During what is considered with us the danger period of last year, the Board of Health of the State of Louisiana protested against being thus subjected to the danger of epidemic which we were using our means and energies to keep away, and this protest failing of securing any change, we adopted measures which we thought best for our protection. The health authorities of Florida were notified that we would not allow any persons coming under the above mentioned conditions to enter Louisiana without disinfection of their baggage, or if baggage had been disinfected at Tampa, without undergoing a detention for observation such length of time as would assure safety to the community.

Railroads were notified not to carry such passengers into Louisiana, and that if such were found they would be taken from the trains and sent to the nearest quarantine station.

Florida took umbrage at this action, and it was charged that Louisiana had proclaimed quarantine against Florida. Not so. Louisiana was simply endeavoring to enforce its own regulations against passengers and baggage from Havana. It is a difference of small import whether passengers come to New Orleans via the Mississippi river or via Tampa. The resulting danger is the same, and we proclaim the right to prevent such travel without proper and necessary sanitary precautions, by whatever route it may come.

Therefore, I repeat, we did not quarantine persons or freight from Florida, but we did say, that through the assistance of Florida's regulations, persons should not violate our own quarantine regulations against Havana.

It was and is still far from the intention of Louisiana to provoke controversy with Florida. We simply ask that she shall not expose us through a lax system. If the State of Florida alone were to receive such passengers and retain them within her borders, we should enter no word of protest, but be ever vigilant for the first spark of danger. But when they can come to us without having undergone what we consider proper and efficient sanitary treatment, we protest and endeavor to prevent.

In view of all the foregoing we come to this Conference asking the question propounded, seeking advice or suggestion if our views are not concurred in, and requesting an expression through resolution or otherwise whereby this vexing problem may be solved in the interest of harmony between State health authorities, and for the better protection of the people with whose safety from pestilential disease we are charged.

The President: The next subject for discussion will be the question proposed by the State Board of Health of Ohio:

1. Should State Boards of Health have control of the sanitary arrangements of all school buildings to be erected within their boundary?

2. What is the best plan to secure such control?

Discussion opened by Dr. Louis Balch, of Albany, N. Y.

Dr. Balch took the position that local Boards of Health, and not State Boards, should control and look after the sanitary arrangements of school buildings. He gave many examples to show the difficulties a State Board would meet with in attempting to remedy the many evils connected with school buildings.

Dr. Probst: Dr. Balch has mistaken the drift of the question proposed by Ohio. He has confined his remarks to school buildings already erected, and to the various nuisances arising in school life. It is the school buildings *to be erected* that we would urge should be under the control of some central authority. This need not necessarily be the State Board of Health, although it is to be supposed that this Board will better understand the sanitary requirements of school buildings than any other. In our State the matter of erecting school buildings, and the ventilation, heating and lighting of the same, is left entirely in the hands of school boards or school directors—men often guiltless of any knowledge of sanitation or the sanitary requirements of school buildings. Especially is this true of the smaller towns and country districts. It has seemed to us that it would be advisable to require the plans of all school buildings to be submitted to the State Board of Health, or to some other State authority, and to have its approval before allowing the buildings to be erected.

As for the inspection of school buildings already erected, our laws require our local Boards of Health to do this semi-annually, and we would not wish to have this changed.

The question was further discussed by Dr. McCormock, Dr. Balch and others.

Adjourned until ten o'clock Monday.

SECOND SESSION.

The President announced as the first order of business for the second day the discussion of the question proposed by the State Board of Health of Kentucky. What should State and local Boards of Health teach, and what should they do to prevent consumption? Dr. Bryce opened the discussion by reading the following paper:

HOW CONSUMPTION IS SPREAD, AND MEASURES FOR ITS PREVENTION.

Dr. P. H. BRYCE, M. D., Secretary Provincial Board of Health of Ontario.

In view not only of the fact of consumption being of all causes the one producing the greatest number of deaths in temperate climates, wherever settlement is advanced,

but also because of public attention having recently been specially directed to the experiments whereby it was hoped Dr. Koch had obtained a sovereign remedy for the disease spread over the known world, it is proper that we should anew point out the paramount importance of the public realizing the nature of the conditions under which, in every day life, the disease gains a foothold in the individual, and of how people generally, can do much to lessen the dangers to which they are exposed.

1. HISTORY OF THE DISEASE.—Consumption means a wasting or consuming of the physical organism, and owing to this, received the Greek designation, *phthisis* (a wasting). Owing to little nodules, or tubers appearing in the lungs and other tissues of the body, it has been called *tubercle*, and is now scientifically designated *tuberculosis*. The real nature of the disease has been vainly sought by physicians from the time of Hippocrates, who believed it to be a pus disease originating in the brain, down to within the last twenty years, when biological studies began to throw some light upon its probable cause.

So long ago as 1761, Morgagni and his school believed in the contagion of consumption, but this view has not been generally held till the present day, when through direct experiments, Villemin, in 1866, showed by inoculating rabbits with tuberculous matter, that the disease could be artificially produced, has its infectious character been established.

He concluded:

1. "Tuberculosis is a specific disease.
2. It is an inoculable disease.
3. It may be successfully inoculated in rabbits from man.
4. It belongs, therefore, among the virulent affections, and takes its place in classification with small-pox, scarlet fever, and more especially with glanders."

He declared that the disease arises by germs suspended in the air, or contained in the peculiar tuberculous matter. The development of the science of micro-biology or bacteriology has only served to confirm Villemin's conclusions.

"By these investigations of the pest the stage had been quietly set for the final scene in the history of tuberculosis." Koch had solved the problem of separating or isolating individual micro-organisms, and in 1882 gave to the world his memorable work on "*The Etiology of Tuberculosis*." In it he described the cause of consumption or tuberculosis as being a germ or microscopic plant in the shape of a slender microbe rod, five times as long as broad, generally curved in shape, with rounded ends, and provided with spores (seeds) which represent its permanent form. These were found by him in the tubercles or nodules, from the lungs and the brain of man, from inflamed scrofulous glands, joint inflammations from the chalky nodules of the lungs of animals, the hog, ape, guinea pig, rabbit, and other animals. Ten years have served only to confirm Dr. Koch's first conclusions, and have greatly extended our knowledge regarding the susceptibility of animals to the disease, and of many conditions under which the disease is propagated and disseminated. Dogs, cattle, chickens, and other fowls have all been found subject to tuberculosis; while its dissemination by means of the flesh and milk of animals has recently been proven by indubitable evidence.

2. PREVALENCE OF THE DISEASE.—It will not be wondered at that a disease with a history so ancient, should, during so many centuries, have found its way into every portion of the habitable globe, wherever the conditions were such as to make its existence possible. That it has spread amongst all civilized races, through favoring conditions, will be shown later on; that there are few families in all Europe whose ancestors have not at some time or other suffered from it, will probably be admitted, though that there are many existing families who have no history of ancestral taint for several generations, abundant evidence would seem to prove. This being admitted, and the affinities of the disease with glanders and leprosy being assumed, the comforting conclusion is forced upon us, that as compulsory destruction of glandered horses has eradicated this disease from many communities, and as segregation or isolation of lepers has practically cast this opprobrious disease out from amongst Anglo-Saxon races, so consumption, in some

perhaps far off and ideal condition of human society, may similarly become a matter of only historical interest to the physician and statistician.

As the causes and contagiousness of Consumption have become known, so its hereditary nature becomes less insisted upon, and the possibility of the disease being induced, becomes proportionately prominent.

To illustrate, however, the task society has before it, the following figures are given :

During the 25 years ending 1886, the average total deaths from phthisis have been 50,000 yearly, in England, and those from other tubercular affections 17,700; in all, nearly 68,000.

That however great this may be, it means a notable reduction, is gathered from the following tables.

TABLE 1—MORTALITY PER MILLION. PERSONS OF ALL AGES.

Period.	1857-60.	1861-70.	1871-80.	1881.	1882.	1883.	1884.	1885.	1886.	1887.
Phthisis.....	2,679	2,475	2,116	1,885	1,844	1,870	1,812	1,752	1,718	1,591
Other tuber- cular dis- eases.....	804	784	762	705	729	707	738	654	727	658

TABLE 2—ONTARIO, 1881. PHTHISIS IN PERSONS OVER ONE YEAR.

	Number.	Per cent. of deaths of per- sons over 1 year.	Ratio to population.
In ten cities.....	464	14.6	2.04
In towns.....	213	17.0	2.01
Rest of Province.....	1,720	13.0	1.08

Ratio of consumption to all causes :

In cities..... 14.67 per cent.

In towns..... 17.00 “

In country..... 13.00 “

TABLE 3—GENERAL DEATH-RATE FROM PHTHISIS IN 100,000 POPULATION—ENGLAND.

	A, Agricultural pursuits.		B, Industrial pursuits.	
	Men.	Women.	Men.	Women.
1858-1867	209	253	243	275
1868-1877	190	205	230	224
1878-1886	158	165	191	179

TABLE 4—DEATH-RATE FROM PHTHISIS—ENGLAND.

	Men.		Women.	
	A.	B.	A.	B.
1850-57.....	100		100	
1858-67.....	79	92	87	95
1867-77.....	67	66	71	77
1878-86.....	59	72	56	61

In the above English tables are found many interesting facts; of these one is notable, viz., the fact as seen in Table 3, that in agricultural communities the proportion of deaths from phthisis thirty years ago was almost equal to that of those engaged in industrial pursuits. While this serves to especially illustrate the insanitary condition of the farm-laboring class in those years, it points similarly to the fact that even with the many modern improvements in the sanitary condition of work-shops, yet the overcrowding which is induced by increased manufacturing industries, has failed to equal the improvements which have marked the habits of life of the English working classes. The great difference between the class in England and in Ontario is gathered from the statement joined figures. See Table 2.

While the reduction of the death-rate from phthisis in those countries where modern sanitation has gained a sure foothold, is most satisfactory, yet the scientific investigations of recent years have shown that the existence of phthisis is by no means limited to the human race. As long ago as 1846 Klencke urged the probability of the milk of tubercular cows being capable of spreading the infection. And in France and Germany rigid inspection of dairy cows is required. That such inspection is required will be gathered from the following statements:

In Edinburgh, of 660 cows, 37 had mammitis (or 6 per cent. probably, tubercular.)

Dr. Cruikshank, in 1889, in the report of the Agricultural Department of the privy council, states from his own observations and experiments that:

- (1.) Cows with tuberculosis of the udder are to be found in dairies in this country.
- (2.) The milk of these cows is, as a rule, mixed with the general supply.
- (3.) The milk, in cases of udder tuberculosis, contains tubercle bacilli.
- (4.) Rabbits inoculated with or fed upon milk containing tubercle bacilli, contract tuberculosis.

From these facts it is reasonable to conclude that there may be danger from using the milk of cows with tuberculous udders, and therefore strict inspection of dairies should be enforced.

That, however, this may not be sufficient to ward off all danger, is gathered from the statement of Prof. Nocard, at the Paris congress of 1888, to the effect that it is almost impossible to tell when the udder has become involved, until towards the last stage of the infection.

The recent very complete experiments reported by Dr. Ernst, of Harvard University, give some idea of how great this danger from milk may become.

In February last he appeared before the committee on public health of the Massachusetts Legislature, and gave evidence on the results of some experiments made at the instance of the society for promoting agriculture, and conducted by Dr. A. K. Stone.

He stated that of 1,200 to 1,300 answers to a circular all but two expressed their belief in the possibility of transmitting tuberculosis by milk. He has records of probable infection of children from the milk of tuberculous mothers, and cases of infection from a tuberculous cow. Veterinarians give instances of infection of calves from tuberculous cows, and he has in his experiments in the most positive way, proved the extreme infectiousness of milk in cases of tuberculous cows.

Dr. Ernst started out with the intention of determining, if possible, the infectiousness of the milk of cows where the udder did not appear diseased. One hundred and twenty-six distinct and separate examinations of the milk, from different cattle were made—each examination meaning three or four days' work. As the result of careful examination, out of 126 series of cover glasses, the bacillus tuberculosis in milk coming from cows having no tuberculous udders at all (shown by post mortem) was found in 16 cases, or in 13 per cent.

"By inoculation of the same milk in rabbits and guinea-pigs, in 74 inoculations we produced 6 cases of tuberculosis, the inoculation being from only one to three drops of milk. This means in over 8 per cent. in rabbits, and in over 13 per cent. guinea-pigs.

"From feeding experiments with 12 pigs, nearly 50 per cent. became tuberculous, and of 23 calves, 8 or 33 per cent. became tuberculous."

Examination made of samples of milk collected from the city supply of Boston similarly showed, both by inoculation and microscope, even in the mixed milk taken from a number of cows, the presence of the virus of tuberculosis.

That this is possible may be judged from the recent experiments of Forster, who has found that bacilli of tuberculosis live in milk at least ten days.

But not only is tubercle prevalent in milch cows since the inspection of carcasses intended for food, carried on especially in France and Germany, also shows a very notable percentage of tuberculous animals.

Toussaint in the *Congres a Tuberculose*, held in Paris, 1888, gives the percentage of tuberculous cattle as 6 per cent., while more recent German statistics taken from the report of the royal health officer, Berlin, for 1889, give the following results :

	Total cattle inspected.	Total infected.	Per cent.
Sweden, 1886.....	.....	906	.....
“ 1887.....	.....	1,110	.....
Rotterdam, 1887.....	14,136	344	2.5
“ 1888.....	16,918	543	3.2
Amsterdam.....	28,000	495	.....
Munich, 1888.....	17,766	1,022	5.7
Grande Duchy Baden for $\frac{3}{4}$ of year, 1888.....	6,421	338	5.2
Dresden.....	.....	.....	1.7 of all cattle.
Saxony, 1889.....	34,975	3,986	11.4 (localities varied from 1.1 to 15.8 per cent.
Augsberg, 1889.....	13,193	512	3.95
.....	.....	Cows alone	7.3

It was found in Saxony that tuberculosis increased with age in cattle, nearly half the cases being in cattle over six years of age.

Another fact of extreme importance has been proved by Bayard, who, in 1889, found that the ratio of frequency of occurrence of tuberculosis in men and animals in different districts was almost parallel in both cases.

The absolute necessity for enforcing sanitary inspection and improvements is seen from the investigations of Hirschberger, who injected guinea-pigs with the milk of tubercular cows. While 55 per cent. of these died of tuberculosis, he was able to find the bacilli of tuberculosis in the milk in only one instance.

Poultry, as has been pointed out, are very subject to the disease.

3. **PREDISPOSING CAUSES.**—While much has been said and written on this subject, daily evidences go to show that unsanitary conditions under all circumstances, and understood as applying to every state and stage of human existence, are the largest factor in the causation of consumption.

(a) *Influences of Heredity.*—Popular and professional opinion have both accorded to heredity the principal exciting cause; but the most scientific teachings of the present day are that all that is inherited is a tendency due to imperfect development, not of organism in its gross or composite form, but in the structural or cell elements of its tissues. It will be manifest that if the delicate mother has a child weak at birth, it is probable in the very nature of things that it will be imperfectly nourished by her, and the innate tendency will be rather developed than lessened. That this is true seems to be borne out by the fact of the enormous numbers of children dying within the first year or two of birth from tuberculosis of the intestinal tract and neighboring glands.

Cornil has shown that the bacilli are taken into the system without any necessary abrasion of the mucous membrane, and that the intestinal tract should be the common avenue of infection in children, will be accepted without discussion.

The urgent necessity for increased attention to this period of danger is illustrated by statistics. Thus the Registrar-General of England has shown that while the death-rate per million from phthisis and tubercular brain disease since 1861-70 has decreased, that from *tabes mesenterica* and *scrofula* has increased; thus:

	Phthisis.	Hydrocephalus, tubercular meningitis.	Tabes mesenterica.
1861-70.....	968	2,213	2,267
1871-80	767	1,800	2,550

To the mal-nutrition which plays so fatal a part in those with a tendency, as infants, we can see that the tendency is by no means at an end with the teething period.

Everywhere, but especially in the dwellings of the poor is seen crowding with uncleanliness, and food, poor both in amount and quality, and in its preparation.

The following from the Local Government's Board's Report for 1889 shows the necessity for attention to this source of disease. "Milk continues to be the chief subject of analysis; out of 26,344 samples of various articles of food, drink and drugs, no less an 10,859 were of what professed to be milk, of which 11.9 per cent. were condemned."

"While in one of the London districts, St. Pancras, out of 129 samples, no less than 55, or nearly 43 per cent. were condemned."

The following instance illustrates the enormity of the crime of adulteration, and the inadequacy of the fine to prevent adulterating.

"In another case in which the milk vendor stated that he rarely sold more than a farthing's worth at a time, the sample taken was found diluted with 15 per cent. of water, but the magistrate considered that one shilling was an adequate fine. On this decision the public analyst comments as follows:" "It is these small portions of milk which are used to fill the bottles of young children, and are often diluted by the parents after the purchase, and thus it is impossible to say how weak the milk becomes before the same is used, but it is not difficult to understand why the mortality amongst the children of the poor is so great."

As might be inferred, the dangers minimized by the small amount of milk used by the poorer classes, are on the other hand increased from their milk supply, of the poorest quality, being more likely to come from dairies inferior both as regards the healthfulness of the cows, and the cleanliness of their surroundings. The high mortality amongst the children of the poor may fairly be charged in a large part to the marasmus arising from mal-nutrition due to insufficient and unwholesome food.

Under these circumstances it is plain that whatever inherited weakness there may be, the subsequent conditions result in a lessening of the natural resistance of the system to the disease.

Councilman well illustrates the difference in the resisting power of different individuals by the amount of connective tissue formation thrown around infected points, as a cautery or miliary tubercle. He says:

"In some cases (in autopsies) almost nothing of this is seen and the disease passes rapidly into inflammation and caseation. These differences show themselves in different organs of the body and indurated and healed apices of lymph and bronchial glands are common."

Referring to the assumed predisposition in combating hereditary tuberculosis, he further says: "All conditions of life which produce a low state of vitality in the system, predispose to consumption."

Turning then to some of these, in addition to what has been said re-improper and deficient food, we would place first—

(b) *Overcrowding*.—The following statistics re-increase of general mortality according to the population per acre, is of interest.

James T. Hammach, F. S. S., Assistant Superintendent of Statistics, Registrar-General's Office, says: speaking of the relation between density of population and mortality from consumption: "The facts about to be adduced will show that density of population, so far as being an unimportant element with regard to the mortality from consumption, is in fact a very potent agent in producing that fearful and destructive malady."

"Overcrowding is of two kinds. (1) On the superficial area, (2) in cubic space; and either may exist independently of the other. In the country where there is no overcrowding, a laborer's cottage may be so crowded by its inmates that disease may break out; while in the case of model lodging-houses and many well-constructed public institutions, it is quite possible, by a suitable construction of buildings, to have a dense population living healthily because occupying a large cubical space."

"Thus in the districts with the least density, the deaths from consumption were 375, and in those of most density, 485 to 100,000 living; while other lung diseases caused 914 deaths in the densest, against 659 in the least dense districts out of the same numbers living—the deaths out of the living, not the proportion they bear to the mortality from all causes, being the true index to the fatality of particular diseases."

In the Registrar-General's report the mortality from different diseases in London and twenty-four other city districts with an aggregate population of 3,769,000, was contrasted with the mortality from the same diseases in counties containing a population of 3,559,000, chiefly engaged in agriculture.

TABLE 5.

Groups of ten districts each.	Density.	Annual rate of mortality per 100,000 living.	
	Square yards to each person.	From phthisis.	Other diseases of the respiratory organs.
No. 1.....	180	375	659
No. 2.....	119	405	771
No. 3.....	35	485	914

The tendency to consumption, Dr. Farr remarks, was increased twenty-four per cent. to typhus fifty-five per cent. in the town districts; but as the absolute mortality from consumption is three times as great as from typhus in towns, and nearly four times as great in the country, the excess of deaths from consumption, caused by the insalubrity of towns, is greater than the excess of deaths by typhus, a fact which has been hitherto overlooked. The deaths from phthisis were 437 in the towns and 351 in the country districts, to 100,000 living.

That this increased mortality has its relations to the directly increased dangers of infection may be seen from the following investigations on the relative number of germs, and amount of organic impurities in houses with different number of rooms, by Prof. Carnelley, of Dundee:

	No. of cases.	Average space per person.	Average carbonic acid.	Average organic matter.	Average micro-organisms.
One-roomed house—					
Dirty.....	7	200	9.9	18.1	41
Dirtier.....	13	221	10.7	13.5	49
Very dirty.....	6	220	11.0	15.1	93
Clean	1	295	8.0	13.1	18
Two-roomed houses—					
Very clean.....	2	273	12.5	10.8	10
Clean	4	264	9.3	7.7	22
Dirty.....	7	233	9.4	11.2	69
Naturally ventilated boarding schools—					
Cleaner.....	12	167	19.7	18.1	91
Average cleanliness.....	12	166	14.2	16.2	125
Dirtier.....	12	191	22.5	15.2	198
Mechanically ventilated schools—					
Cleanest.....	7	194	12.5	12.7	
Clean	11	155	12.8	8.3	10
Less clean	4	152	10.8	9.8	30

The statistics already quoted in Table 3, showing the number of deaths amongst the women of the agricultural class in England, as compared with men, show the malign influences of indoor life, the ratio being 230 women to 205 men; and of the greater mortality of industrial operations, the ratio being 467 to 664, fully illustrates two points, that with the decreased resistance of the system due to industrial pursuits is associated the increased danger due to greater exposure in an atmosphere impure and containing the bacilli of tuberculosis.

"Mager, from Bavarian statistics, estimates the proportion of deaths from phthisis between town and country at 100 to 61." (Hirsch.)

This increase of the phthical amongst the industrial classes is due not alone to the increased dangers of infection, but to the nature of the occupation. "Dusty trades," says Wynter Blythe, "are specially liable to produce tubercular disease."

Dr. C. Lombard states that of 1,000 deaths of adults from consumption, they could be classed as follows:

Occupations with mineral emanation.....	176
" various dusts.....	145
Sedentary life.....	140
Workshop.....	138
Hot and dry air.....	127
Stooping posture.....	122
Sudden movements of arms.....	116
Muscular exercise by active life.....	89
Exercise of voice.....	75
Working in open air.....	73
Animal emanation.....	60
Occupations in which watery vapor is breathed ..	53

Similarly, according to Hirsch, "Smith has ascertained for one thousand persons treated for consumption at the Brompton hospital, that seventy per cent. of them had been in the habit of spending their time in overcrowded, hot and dusty places indoors."

"The same circumstances seem to account for the strikingly common occurrence of phthisis in nunneries, seminaries, and such institutions, in evidence whereof a number of observations have been brought forward by Foucault."

Finally, I may state, that in the 1890 report of the Inspector of Prisons and Public Charities in Ontario, where the public institutions have by all observers received high commendation, the aggregation of population would seem to produce similar results. Thus, of a total population of insane asylums, amounting to 3,500, having 231 deaths, or sixty-six per 1,000, there were twenty-nine due to phthisis, i. e., forty-four per cent.

Of the total number who died, 153 or 66 per cent. had been in the asylum over eighteen months, but no data are given showing what proportion of those who died from phthisis, died within that period.

Influence of Soil and Climate. Says Hirsh *re* pneumonia: "Elevation and configuration, situation on the coast or in the interior, geological character and the like, are all irrelevant in themselves; they have a significance for the pathogenesis only in so far as they determine the climate or the sort of weather in any locality; and it is to be keeping that fact in mind that we may explain the contradictory conclusions which have been arrived at through attending too rigidly to each of the factors named, as if it could be an element in the causation by itself."

This must be similarly stated with regard to their influence on the prevalence of phthisis; while this writer very properly states, after a statistical study of mortality tables of different countries, "that circumstances of climate are on the whole, of merely subordinate importance for the limits of that distribution;" "that the disease occurs *ceterius paribus* in all geographical zones with uniform frequency—that in many regions the number of cases has gone up considerably without any corresponding changes

in the climate, but under circumstances of another kind." The mean level of the temperature therefore, has no significance, but it exercises a very decided influence on the course of the disease; for—it runs a much more rapid and pernicious course in tropical countries than in higher latitudes."

Hirsch further affirms that "severe and sudden changes of temperature from day to day have little influence on their own account." "No doubt we have to take into account a fact of importance for the question before us, viz., that all those regions have an absolutely dry climate. The circumstances are naturally different in the case of a damp climate subject to great variation of the temperature—circumstances which come out most decidedly in equatorial and sub-tropical regions."

Regarding the influence of ground water upon the prevalence of consumption, while it is very difficult to separate the influence of different factors, still evidence seems sufficient to make us conclude that this is an important factor in the prevalence of consumption.

Bowditch and Buchanan, after extended researches, especially by the latter, have affirmed this influence; and Buchanan remains of the opinion that the exceptions to the rule worked out by him, simply indicate that other etiological factors besides the influence of soil come into the account under the given circumstances—and seem to neutralize the benefits even of the most favorable condition of soil.

An interesting point seems to have been determined from the Ontario statistics. Thus the Health Districts 6 and 7 present two very decided differences of physical surface conditions. East District 6 is a central plateau averaging nearly 1,000 feet above the sea, fifty or more miles from the Great Lakes, and having a soil largely gravelly loam; while District 7 is the Niagara peninsula between Lakes Erie and Ontario, about 700 feet above the sea, flat, and having a soil largely of post-glacial clays. The latter has been till recent years very malarious, while the former has practically never had intermittent fevers.

An analysis of the deaths from phthisis, in 1881 gave the following result:

	Percentage of total deaths.	Ratio per 1,000.
District 6.....	8.5	1.02
District 7.....	12.7	1.64

These latter figures are to me very convincing, for the reason that in neither district are there any large towns, while the great bulk of the population in both is engaged in agricultural pursuits, is of the same race, and equally industrious and intelligent.

Setting forth, therefore, in brief form the conclusions based upon this statistical study, I would say—

1. That we must recognize the disease phthisis as beyond question a contagious disease, belonging to the category wherein are placed glanders and leprosy.

2. That assuming this to be true beyond question, the attitude we must as officers of health assume, is to treat it as such, and hence must examine into what practical measures are to be taken by us for preventing it, and as far as possible, limiting its dissemination from those centers where we find it existing.

3. Arguing by inferences fairly drawn from the numerous statistics already pre-

sented, I conclude that we must primarily regard the question of dealing practically with the problem as being one having in an especial sense the qualities of a sanitary crusade.

4. This I infer means that the extinction of phthisis must be looked for by our urging that to deal with it successfully, means as with diphtheria and other diseases of its class, we must endeavor:

(a.) To prevent it by removing the causes which promote it.

(b.) By so regulating the habits and lives of those affected with it as to prevent them from becoming sources of infection to the healthy.

(c.) By the establishment of hospitals and sanatoria, where those infected may have the best possible opportunities of being cured of the disease.

5. Referring to these points in their order I would say as regards the prevention of the disease, we must look to the private or family home of the people.

Here the matters specially to be inquired into are:

1. The removal of dampness both under and around houses, as also the removal of wood or other organic matter tending to decay or promote fungoid growth.

2. The establishing of efficient and complete plumbing and drainage.

3. The introduction of a pure water supply.

4. The maintenance of purity of the atmosphere of the house by cleanliness, ventilation, and the abundance of sunlight.

5. Proper and equable heating of the living rooms.

6. Attention to the clothing of people whether in the house or out of it. It must be clean, non-conducting, and sufficient.

7. The use of nutritious and wholesome food, notably of animal foods, as meat, milk, etc.

6. This means that we must follow the people to:

(1) The school, and see that those desiderata required for the healthy home be had in the school.

(2) The work-room and shop where there is the constant difficulty of over-crowding and uncleanness.

(3) The trade or occupation, notably into our woollen factories where animal materials are handled, to the works where stone-cutting, grinding, etc., are carried on; and to those where effluvia and poisonous particles are given off, as in painting, card-glazing, arsenical manufacturing. In this direction indeed our labors must be simply never-ceasing, for the dangers to health are almost as multifarious as the different industries carried on.

(4) The municipal home.

Here we have to deal with the large problem of municipal sanitation. This means, (a) town drainage; (b) town sewerage; (c) town paving, (d) public water works; (e) inspection of filth nuisances; (f) compulsory notification of cases of consumption.

B. This means the removal of consumptives from daily contact with others in public institutions, in work-shops, etc., (g) sanitary and medical education of the people in the homes of such, as to the dangers of personal contact.

The numerous details on this point must naturally be effective to the degree that public sanitation acquires an influence over the person and in the home, and to the degree that the medical profession in their private practice insist on the danger of infection and on the carrying out in the homes of measures to limit this.

The last point is one which specially belongs to our work, viz., the management of municipal hospitals for consumptives, and of sanatoria.

In centuries past lazarettos were numerous in Europe, the confinement of lepers was compulsory, and as a result leprosy can scarcely be said to belong to the category of disease amongst civilized people. There can be no logical reason why municipal and State government aid should not be given to hospitals specially appointed for treating

consumption. I do not think that it is either practical or advisable that we should teach or urge that segregation of consumptives in such should be made compulsory, but there are abundant reasons why the existence of such homes where the poorer classes can live and be treated, should everywhere be made available.

The question of how far these views can be carried into practice will depend directly upon the appreciation which the public has of the dangers to be apprehended and of the means to be taken to avoid such.

It is within the scope, but not within the time allotted, to discuss on what basis such can be carried out; but it must suffice to say that curative institutions for consumption must be essentially sanatoria, where equable climate, dry air, pure air, sunlight, out-door work and exercise, gymnastics, and indeed every measure going to increase the resisting power of the system may be had to the greatest extent, which any climate makes possible.

Dr. Vaughan said he agreed with the views of Dr. Bryce in nearly every particular. There can be no doubt but that the disease is contagious, and caused by the bacillus tuberculosis; but another element must enter into its production, for without doubt the germs of the disease are widespread, and all of us must at times receive these germs into the system. The germs are most frequently disseminated by means of the sputa, but when the bowels become affected, as they so often do, they are also present in the bowel discharges. State and local boards of health could accomplish great good by teaching the people the danger connected with the sputa and fecal discharges of consumptives, and how properly to disinfect them. Dr. Vaughan was in favor of consumptive hospitals, and thought thorough isolation of cases would eradicate the disease.

He said that while he recognized a possible danger in tuberculous meat and milk, he was inclined to believe their importance, as a means of spreading the disease, had been greatly overestimated.

Dr. Balch spoke in favor of all efforts to secure improved sanitation, as a means of combatting consumption. It was an undoubted fact that improvements in drainage, and in the ventilation of houses and workshops, had done much to lessen the prevalence of the disease. "Isolation of diseased persons is all very pretty in theory, and would probably be very effective in practice, but it can not possibly be done." He told of the difficulty he had encountered in causing the removal to hospitals of persons suffering with small-pox, a disease all dreaded, and said this indicated the impracticability of removing consumptives to hospitals. If consumptives were allowed at large, and he saw no way of preventing this, he thought it would not be possible to secure disinfection of their sputa.

Dr. Salomon related a case showing the infectious character of consumption, and the length of time the germs may retain their vitality. The case was related to him by an intelligent man in New Orleans, and while the Doctor had not verified the facts, he considered them to be true. A family

moved into a house in which there had been a death from consumption. The father occupied the room in which the first case had died. He contracted the disease and died within two years. One of the sons then occupied the room, and he also contracted consumption and died. The room was not used for some time when the second son moved into it, and he also contracted the disease and died. The house was then shut up and offered for sale, but was not disposed of for several years. It was finally sold, and the person who occupied the room in which the other cases occurred, took consumption and died. The room was then thoroughly cleaned and disinfected, the walls scraped and re-kalsomined, and from that time on no other cases occurred in the house.

Dr. Homan said that at a recent visit to a certain health resort he was struck with the number of cases of consumption reported among the residents. The rooms were fitted up with heavy carpets and thick curtains, well calculated to receive and retain the infection of the disease, while disinfection, apparently, was not practiced.

He thought more attention should be given to these matters at the various health resorts. He suggested that consumptives could provide themselves with cloths for receiving sputa, to be burned as soon after using as possible. This is the best means of disposing of infectious sputa; and the people would understand us better if we use the term "destruction of sputa," instead of disinfection.

Dr. Beeler said that consumption was undoubtedly now much more prevalent among the negroes than it was before the war. He attributed this to the overcrowded and illy-ventilated dwellings in which the negroes, especially those living in cities, now dwell. The race is undoubtedly much more susceptible to the disease than formerly, and their habits of life are such that the germs of consumption are indefinitely preserved in their dwellings, when once introduced.

Dr. Bryce, in closing the discussion, said he was pleased to observe that the majority of the conclusions of his paper had been so well sustained by the members of the Conference. He did not contemplate the compulsory isolation of consumptives, but to provide hospitals where the poor would gladly go to be treated.

A large number of our workshops are, from lack of proper ventilation, and other causes, conducive to consumption. Public authorities should be able to regulate such places; and when one of the workmen shows evidence of the disease, in the interest of his fellow workmen, and for his own sake, he should be removed.

Every city could afford to have at its outskirts a place where such persons could go, and by proper arrangements for treatment, fresh air and good food, many of these might recover. Physicians, householders and

employers should be required to report all cases of the disease, and health authorities could then inquire into the sanitary conditions of dwellings and workshops, which, possibly, were responsible for the disease.

On motion of Dr. Bryce, it was voted to appoint a committee of three to report upon the measures to be recommended for the prevention of consumption.

The chair appointed as members of this committee, Dr. P. H. Bryce, Dr. L. F. Salomon, Dr. Victor C. Vaughan. Dr. Irving A. Watson and Dr. Henry B. Baker were subsequently added to this committee.

The next question taken up was:

"WOULD THE APPOINTMENT OF MEDICAL HEALTH OFFICERS FOR
COUNTIES, IN PLACE OF TOWNSHIP OFFICERS, AND PAID
FOR DEVOTING THEIR TIME EXCLUSIVELY TO
PUBLIC HEALTH WORK, BE ADVANTAGEOUS AND PRACTICABLE."

Dr. C. A. Lindsley opened the discussion by reading the following paper:

The first thought this question suggests is, that such a practice would develop a body of sanitarians much superior to any which the township system could possibly produce. In that one result would be found a large measure of advantage.

The administration of public hygiene in these days is not any longer to be successfully undertaken by any good citizen, however much he may be esteemed by his fellow townsmen for his skill as a blacksmith, his honesty as a grocer or banker, his fair mindedness as a justice of the peace, or even for his judgment as the family doctor. Public hygiene is not now a matter of diet and flannel, and of taking cold.

Public sanitation is taking on a scientific character. Its administration is based on principles, which are more or less settled and fixed. The spread of infectious and contagious diseases is governed by recognized natural laws. It follows, therefore, that the control of those diseases, and the promotion and conservation of the public health, is only to be undertaken successfully with a full knowledge of these laws and of the means suggested by such knowledge.

The above statement reduced to its simplest terms, reads—a health officer requires a special education and training.

The special education and training implies a business, an occupation, a means of earning a living, an object worthy of such preparation.

The ideal health officer is one who has had a good medical education, as an indispensable foundation for his special work. It is almost equally important that he should have the experience of some years of general practice, as a further basis of preparation, because he should be qualified to be an authority in the diagnosis of those contagious and infectious diseases which are dangerous to the public; and also because such experience, and the matured age which it implies, will be an additional influence in winning the confidence of the people whom he serves.

Supplementary to such acquired qualifications he should be a man with the natural gifts of a sound judgment, of high integrity of character, of clear and quick perceptions, and especially of such ready tact in managing affairs as to command the respectful consideration of the public. These are qualifications of no mean order. They represent a higher standard of acquired and natural ability than the average man possesses. But

the sort of man so described, corresponds well with the duties and responsibilities of the high functions of his office.

To him are entrusted the highest interests of man in the social state. He is the appointed guardian and custodian of the public health, and in that capacity one of the chief factors in the promotion of public prosperity and general happiness. For there is nothing so disastrous to the public welfare, nothing so productive of personal misery and suffering, as disease and death.

A nation whose people are physically feeble, or which is subject to frequent epidemics, can not be said to be prosperous in any true sense.

Looking then at the question, from a stand-point which takes in view the rare qualifications necessary for a good health officer, the preparation for its duties, and the magnitude and importance of the interests involved, it seems self-evident that it is for the best public good, that the true health officer should find full occupation in the exercise of his official functions; that one qualified as he should be for such high and grave responsibilities should not have his attention diverted from his serious obligations to the public by being obliged to earn a subsistence in other pursuits.

It seems right and fitting that the man who has been educated and trained for the office should be utilized to the best advantage in the public interest.

Thus the question presents itself to my mind in a speculative way.

It remains to notice the practical application of these reflections.

I assume that in the interests of the public, a health officer should be nothing else in a business or professional way.

All experience teaches that it is incompatible with the public interest that he should be a practitioner of medicine; or else, that it is incompatible with his own interest that he should be a health officer in the same community in which he practices.

A long experience in the administration of public hygiene has impressed me with the immovable conviction that a health officer who is never criticised and found fault with, who makes no enemies, who is not heartily cursed and sworn at by his profane neighbors, is of no practical use as a health officer. And on the other hand, a health officer who is faithful to his public duties, impartial and resolute in his official acts, will gradually, steadily and surely surrender a large share of his patients to the care of his professional competitors.

The two pursuits can not be harmoniously joined in the same town.

Here, then, is a serious practical difficulty with town health officers. In the first place, every town does not possess an available and competent man. He should be chosen always from the medical profession; no others are fully qualified for the office. But if it be attempted to unite in one person the special duties of medical practitioner and health officer, it soon inevitably happens that there is a conflict between public duty and personal interest, and one must be betrayed or the other will surely suffer.

The wealthy landlord will not meekly receive an order from his family physician to overhaul the plumbing in his tenement houses, to drain the cellars, to remove offensive cesspools, etc., etc., and so make the dwellings of his tenants safer habitations. After receiving such orders that wealthy landlord will call upon Dr. Smith to attend his family, or perhaps Dr. Health Officer foreseeing that result, will prudently omit to send the order and the tenants will continue to endure their wrongs, because it is not the personal interest of the only party who can protect them to do so.

But under the town system that combination of the general practitioner and town health officer is the only practicable method.

The town is not only too narrow a field for a man of the required capacity, but it is also too limited for the best use of such service and for the best results.

Public hygiene deals not alone with local conditions. It has to do with the welfare of populations, settled over wide areas of territory, and under such varying conditions, that the common good of the whole can not be attained without a comprehensive

acquaintance with the mutual relations and interests which the separate towns or communities within those areas may bear to each other.

There are undertakings essential to the promotion of the general public health which require concert of action on the part of several more or less separated communities. It is hard to believe that the wisest measures will be proposed by health officers whose official duties are limited to the narrow confines of their own towns, and whose conceptions of such duties are generally even more limited. It is not reasonable to expect that men whose services to the public in this line are usually gratuitous, or very badly paid, will or can give such studious and careful attention to the sanitary wants not only of their own towns, but of their sanitary relations to other towns, as to be competent and wise counselors for the best good of the whole. On the other hand, it often happens that a town Board of Health, seeking only the selfish interests of its own citizens, and regardless of others, proceeds to do things which are directly injurious to the health and welfare of adjoining towns.

From the nature of the existing facts, and from a knowledge of the principles and laws which should govern in the general administration of public hygiene, it is self-evident that the greatest good to the greatest number will never be realized from separate, unsystematized and independent town boards of health. Town boards and town officials have their uses and proper functions, which are of great value, and in any plan of operations will be found to be essential to the best success. But the work of town boards needs direction and unification.

Wherever the common interest of several towns are involved, that interest will be best subserved, if the efforts undertaken be under the direction of one mind which has intelligent and comprehensive knowledge of their mutual relations and needs.

The General must command the operations of the army. The Colonels and Majors, the Captains and Lieutenants, must act in concert to accomplish his plans, or the army becomes a mob.

It may be urged in this connection that the State Boards of Health should be the directing power, the Commanding General. That, I believe, is true. Although they are not all constituted with such powers. Several of them are like that of Connecticut being only an advisory body and having no mandatory powers at all. But even if the State Board is authorized to be commander-in-chief, there is a long space between the State Board and each little town board. There is no possibility of bringing them into such close relations, that its authority can be exercised in the most practical and useful way. It requires the intermediate grades of officials to make a useful connection between them. And here the county health officers would form the connecting link. The territory under the jurisdiction of the county health officer would not be so extensive that he could not, in a reasonable time become personally acquainted with its topography in matters affecting health. He could, in many instances, by personal investigation, discover and expose the origin of primary cases of communicable diseases, and by such forcible illustration persuade and instruct the public mind. His practical experience would be of great value in arresting and controlling epidemics, if they occurred, but of still greater value in preventing them.

The time has fully arrived when communities and populations should accept the fact, that the proper protection and care of the public health is a most important public duty. That its due performance is so dependent upon a scientific knowledge of methods, that it can only be successfully accomplished by trained and qualified officials and that there is great economy in providing for this service in the best and most efficient manner.

Another and great advantage which would be difficult to estimate, because it is one of growth and development and would be enhanced with every year's experience, is that which would come to the State from possessing a body of educated sanitarians, equal in number to its county divisions, and each familiar with the hygienic conditions and sanitary needs of his own jurisdiction.

Such men, selected for their special fitness, holding their office by appointment, and not subject to the caprice of popular elections, but confident of their position, unless by removal for cause, devoting their time and best energies to their duties, would form a bureau of information which might be of the highest benefit to the State Board, and through it, to the people's health.

If now we review the points which have been presented, to-wit: The nature of the work to be done, the qualifications required of those who do it, the impracticability of associating it with other pursuits depending upon public patronage, the hindrances and difficulties resulting from limiting independent sanitary jurisdictions within town boundaries, and the positive advantages of broader territorial supervision, and finally the immeasurable benefit which such a body of educated sanitarians, devoted to their work and familiar with every portion of the State could confer upon it, leaves no doubt in the mind of the speaker that the question should be answered in the affirmative.

The paper was discussed by Drs. Balch, Cochran, Chancellor and others.

Adjourned to 3:30 P. M.

THIRD SESSION.

The committee on the Prevention of Consumption was requested to present a preliminary report at the night session, the completed report to be made at the next meeting of the Conference.

The question proposed by the Provincial Board of Health of Ontario.—

"The advantages of the organization of Rivers Conservancy Commissions, composed of State and Municipal Health Boards, for the protection of streams against deforesting and pollution at their sources and along their courses"—

Was taken up for discussion.

Dr. Salomon, of Louisiana, in opening the discussion, read the following paper:

MR. PRESIDENT AND GENTLEMEN: In the opening of the discussion proposed by the Province of Ontario, it is not my intention to occupy your time with an array of statistics and statement of facts with which you are all familiar.

The question submitted permits of division into two heads for discussion, each, however, somewhat dependent upon the other.

The question as to the deforesting of rivers along their courses was met to a large extent by the discussions before this Conference at its last meeting, and in regard to the views then expressed and the resolution adopted by the Conference, I have little further to add than to say that by the preservation of the forests along water courses, thus securing a slower percolation and filtration through the soil, the pollution of streams may be and undoubtedly is, to a large extent prevented.

Streams near their origins, as a rule, furnish good sources of water supply, but the further away we get from the springs and mountain streams which furnish the initial supply, the less fit do we find the water for drinking purposes.

Without entering into details it will be sufficient to say in regard to the first division of the question that the deforesting of lands adjacent to streams, which permits of a more rapid surface drainage of rain waters directly into such streams, necessarily implies the carrying into them of the organic matters always to be found in regions in which the ground is under cultivation, more particularly so in regard to manured lands and other attendant conditions of the soil which it is unnecessary to enumerate.

As to the consequent floods from deforestry, nothing need be said in addition to what is already a too familiar fact.

It is, however, with the pollution of streams through other than natural causes that we are most concerned, and each succeeding year is adding and will continue to add to the evil and the consequent difficulty of providing a remedy therefor.

Sewerage, and the discharge of refuse of all kinds into streams and rivers from the towns along their banks, is the most potent factor in the pollution of water-courses, and following this, the discharge from factories, often of such a nature as to be destructive to all animal life for miles from the points of discharge.

Dilution by large supply of water in the larger streams may and probably does to some extent mitigate the evil, but we must bear in mind that the smaller streams are not capable of this method of self-purification, owing to limited dilution of the contaminating matters, and in the case of the larger streams it is found that the towns along their courses are so numerous that the continuous succession of sources of pollution allows small chance of purification through dilution or oxidation. Organic and inorganic matters in a state of solution or suspension are thus being constantly added to streams already charged with the same matters, often in a state of putrescence, and with each succeeding town along a water-course the evil is multiplied, and the danger from water-pollution keeps constantly increasing in relative ratio to the places of contamination, the next lower town to a manufacturing city being subjected to all the evils while it may itself be putting forth every effort to keep pure the stream from which its water supply is derived.

Infusoria and other animalculæ may in a large degree aid in purifying the water in such streams, but we are not certain as to the extent of such purification, and should not depend upon these natural agencies alone to accomplish the work; besides, it is very questionable as to the work in this direction that may be thus accomplished, when it is remembered that repeated discharges of sewage and kindred matters will destroy these purifying agents, with the accompanying inevitable result of decomposition and the production of offensive gases.

Sewage, as is well known, often contains the specific poisons of disease, and numerous instances are on record in which towns and cities along water-courses have been afflicted with disease thus brought down to them from adjacent towns.

It would only be trying your patience and occupying the valuable time of the Conference to elaborate upon this subject with which all sanitarians are familiar, and to which I can add nothing new, and in regard to which facts have been so often repeated.

The question before us simply resolves itself into what is best to be done to stop the constantly increasing evil.

I am therefore pleased that the subject has been presented in the way it has by the Province of Ontario, because I believe that in the organization of conservancy commissions as outlined in the question, a practical solution of the question is foreshadowed, and that at the least much good can be accomplished.

Legislation without co-operation would be futile, for while one State might make and enforce laws to prevent the pollution of streams within its own territory, its laws would accomplish little good unless contiguous States should do likewise; and I believe that through the co-operative action of State and municipal Boards of Health the proper legislation may be secured in all States and municipalities, and with united action the good work be carried on.

The importance of this much needed legislation has always engaged the attention of sanitarians, and it may be emphasized by recalling that the first sanitary act upon the English statute books is an act passed in 1388, which act prohibited the pollution of streams, and provided a penalty for its violation.

If then such an act was deemed necessary at a time when the needs of sanitation were little understood, and when the population was very sparse, and manufacturing industries so feebly developed, how much more urgent is the need now for such legislation when our cities and towns are filled with factories discharging their refuse into the rivers, and the teeming thousands of inhabitants along their courses are constantly adding to their pollution, and rendering them unfit for drinkable or other purposes—not only offending the senses, but producing disease and death through the ever continuing contamination.

True, the interests involved are such that the question of prevention at this day is one of immense magnitude, surrounded with many obstacles, and perhaps difficult of accomplishment. No legislation, as yet, has been able to secure the much desired end, but I am of the opinion that with concerted action on the part of health boards, and the securing of local regulations rather than general legislation upon this subject, much can be accomplished; and with each local authority, under the guidance of commissions as contemplated, supervising the streams over which it has jurisdiction, their pollution can be largely controlled or altogether terminated.

Such action, however, necessarily requires concerted and uniform methods of procedure, and it is probably through commissions composed of health officials of contiguous States that the work can be best accomplished. Therefore, Mr. President, I beg to submit the following resolution:

Resolved, That it is the sense of this Conference that the pollution of streams is attaining such magnitude that early action should be taken by State and local Boards of Health looking to its prevention.

Resolved, That a committee of three be appointed to consider the best means of securing the formation of Rivers Conservancy Commissions, composed of State and local Boards of Health, and to recommend such legislation as may be necessary to secure the desired result.

Resolved, That said committee report at the next meeting of this Conference.

Dr. Chancellor said there was great need of State organization, or National aid in preventing the pollution of streams. Rivers in many instances formed the boundaries of States, in which case it was impossible to protect the streams without State co-operation. The Potomac river was given as an illustration. The laws of Maryland for protecting the streams are fairly satisfactory; but he had recently endeavored, unsuccessfully, to secure the aid of West Virginia in preventing the pollution of the Potomac river. He said that Cumberland, Md., had been suffering with an epidemic of typhoid fever for the past two years, some 600 cases having occurred. In looking for the cause of the epidemic it was apparently traceable to the water supply taken from the Potomac, which was polluted with the sewage from Keyser, W. Va., where typhoid fever was prevailing. National aid would probably be needed to control such cases.

Dr. Watson supported Dr. Chancellor's remarks. He said Massachusetts, which has the most comprehensive laws, and a special board to protect its streams, was suffering greatly from the pollution of the Merrimac

river by cities in New Hampshire. It was simply impossible for the present to prevent the large cities along the Merrimac from emptying their sewage into it; it would cost millions of dollars to dispose of their sewage otherwise.

Dr. Metcalf, of Indiana, said they were having trouble in their State from the pollution of streams by the waste from straw board works. One of the largest works in the United States was only about 20 miles from Indianapolis, and this question of pollution of rivers would soon have to be met in their State.

Dr. Reeve said the pollution of streams to some extent was unavoidable, and a question the Conference should consider was whether it was possible, by filtration or otherwise, to so purify a polluted water that it could be safely used for domestic purposes.

Dr. Reynolds thought it would be difficult to secure the co-operation of States needed in many instances to control the pollution of streams, and favored asking for a National law.

Dr. Bryce said in Ontario the question is the protection of one town against another higher up on the same stream. He thought we should settle such State questions before calling on the National Government. In most European countries they have compelled cities to respect the rights of their neighbors, lower down the stream.

Dr. Lee said that action must begin in the States before it reaches the National Government. Philadelphia had the distinction of having the highest typhoid fever death-rate of probably any other American city. They were now having an epidemic of the disease traceable to their water supply. It had been noted that wards supplied with water from storage basins suffered with the disease much less than those supplied direct.

Recently complaint had come to their board of the pollution of streams by salt coming from abandoned wells. The board had made answer that salt was antiseptic, and could not be considered as polluting material. The reply was that the salt in Beaver river interfered with the public water supply for Beaver city, thus compelling them to return to the use of wells, leading to an increase of typhoid fever in their city. The board had introduced a bill in Legislature for the prevention of the pollution of streams. The bill, by implication, included salt. The bill, however, was killed by amendments, and now only excludes wastes from slaughter-houses, dead animals, etc., from streams.

Dr. C. A. Lindsley said they were urging upon towns the necessity of disposing of their sewage in some other manner than by emptying it into streams—such as broad irrigation, intermittent filtration, etc. Their board had been engaged for some time in investigating the pollution of

the streams of Connecticut. In only one instance had Legislature forbidden the emptying of sewage into streams; this was at Meriden.

Dr. Reeve presented the following as supplemental to the resolution:

Resolved, That this committee be requested to consider and report upon the sanitary value, especially to municipalities, of the purification of water in polluted streams, either by the distance which such polluted water has traveled, or by means of filters or storage beds, or by any other artificial methods.

This was accepted by Dr. Salomon, and the resolution was adopted.

Dr. Watson called attention to the work the Massachusetts Board of Health was doing in this direction, as set forth in their last report on water supplies; also to their experiments in sewage filtration, which for the first time, definitely settled important questions relating to water filtration and sewage disposal.

The President said that he would announce the committee called for in the resolution at the next session.

Dr. Lee said that a bill was then pending in the Legislature of his State, relating to water pollution, and moved that the Secretary be instructed to forward a copy of the resolution to the President of the Senate and Chairman of the House of Representatives of Pennsylvania.

The motion was seconded and carried.

The question proposed by Michigan—

“What change, if any, should be made in the present plan for providing a programme for meetings of the Conference”

Was taken up for discussion.

Dr. McCormack said there had always been difficulty in arranging a programme for meetings of the Conference, due to some extent to the neglect of the various Secretaries of State Boards of Health to send questions for discussion.

It had suggested itself that it would be well to have the programme mapped out on the first day of the meeting for the next succeeding meeting. This might be done by a committee, whose report could be acted upon by the Conference.

Dr. Cochran thinks Dr. McCormack's method not a good one. If a committee were appointed at all, he would simply have it act on the questions proposed by the various States.

Dr. C. A. Lindsley said he favored the plan proposed by Dr. McCormack. This committee could receive questions from any State and decide upon their appropriateness for discussion by the Conference. He knew, under the present plan, that it was almost impossible to satisfactorily arrange a programme.

While on the floor he took occasion to say that he thought the conference was now in a position to stand alone, and need not hold its meetings in connection with any other body. He was opposed to calling meetings on Saturday, as it tended to lessen the attendance.

Dr. Bryce thought the President and Secretary should fix the time of meeting, and that the Secretary should ask for propositions for discussion six months before the time of meeting. If the programme was not completed within three months of time, the President and Secretary should fill it.

Dr. Olliphant suggested that delegates could submit questions a year in advance.

The President suggested that the question should go over for another year.

A motion to table the question was made by Dr. Lee.

Dr. Cochran said we are running too much into committee work. The usefulness of our organization depends upon its simplicity and flexibility; without care we will be getting reports too bulky to publish. There is no necessity to publish mere compilations. What we want is the benefit of each individual's work and experience. What he *knows*, and knows so well that he can come here and talk on the subject without cramming for the discussion.

The motion to table the question proposed by Michigan was put and carried.

Dr. Olliphant extended a cordial invitation for the Conference to hold its next meeting in New Orleans.

The Secretary made a statement of the financial condition of the Conference. On motion of Dr. Salomon, it was voted to assess each State and Provincial Board of Health, ten dollars, to be forwarded to the Treasurer.

The President announced that the election of officers, and a paper by Dr. Vaughan, would be the order of business for the evening session.

Adjourned to 8 P. M.

FOURTH SESSION.

The President: I would suggest that the Conference should now dispose of the question of time and place for its next meeting.

Dr. Metcalf moved that the next meeting be held in Washington.

Dr. Watson offered as a substitute that it be held in New Orleans, on the third Tuesday in March, 1892.

Dr. Metcalf invited the Conference to meet in Indianapolis.

Dr. Watson withdrew his motion, and a motion by Dr. Reeve to allow

the officers of the Conference to select a time and place for next meeting prevailed.

Dr. Bryce moved to proceed to the election of officers. Carried.

Dr. Metcalf nominated Dr. J. N. McCormack for President, and moved that the Secretary be instructed to cast a ballot for the Conference for Dr. McCormack. Carried.

The Secretary reported the ballot cast, and Dr. McCormack elected President.

On motion, Dr. C. O. Probst was elected Secretary by acclamation.

On motion, Dr. Henry B. Baker was elected Treasurer by acclamation.

Dr. Vaughan, of Michigan, gave an entertaining talk on "What recent developments have been made in laboratory work of practical value to health boards."

Dr. Vaughan said if a health officer wants a sample of water examined he sends him from the laboratory a sterilized bottle. Determinations for hardness, ammonias, nitrates, nitriles and chlorides are made. Plate cultures are also made. At first he endeavored to study each germ present, but found that this took too long—weeks and months. Now, when the water comes in he immediately makes a plate culture and inoculates a tube of beef tea with a drop of the water. In twenty-four hours he injects some of the beef tea into the abdominal cavity of a white rat. If toxicogenic germs are present, the rat will likely die in 12 to 24 hours. Cultures are then made of the spleen, liver and kidney of the cat, and compared with the plate cultures of the water. Corresponding germs are given further study. In this manner he was able to make a report on the water within 72 hours. It was not altogether satisfactory, but more so than chemical analysis. He could not say that the germs which killed his rats would kill man, but people will not want to drink water that will kill rats. Rats are hard to kill, and the ordinary water germs will not do it. One hundred and nineteen official reports have been made so far, and in thirty-two instances toxicogenic germs have been found. They are usually found in water which has apparently caused typhoid fever. Duluth has just had about 1500 cases of typhoid fever. We found a sewer within 500 feet of the intake pipe of their water-works. An examination of their drinking water showed it to contain poisonous germs. Dr. Vaughn said he had also been working on poisonous cheese. He had not in three years found cheese containing tyrotoxicon. Many contained a poison which kills cats, but has no effect on man. Public sentiment, he said, was in favor of the laboratory.

Dr. Bryce stated that they had secured some funds for laboratory work. Hydrophobia in the Province last summer had created a sentiment

in favor of such work. He had learned of a case where a dog, suffering with hydrophobia, had bitten some cows and some pigs, and finally his master. The animals showed signs of paralysis of the muscles of the pharynx and larynx. He secured the head of a pig that was bitten, and endeavored to inoculate rabbits with the cord. He had failed, producing only septicaemia. The same experience was repeated with the head of one of the cows.

They had lately had an outbreak in hogs of a disease attended with gangrene in the joint, just above the hoof. The disease was communicable and acted somewhat like charbon. They had found what seemed to be the germ of the disease. He said they would try Dr. Vaughan's method of water analysis.

Dr. Vaughan, in answer to a question, said he did not believe that typhoid fever only comes from a pre-existing case of the same disease. He thought water contaminated with the excretions of healthy persons may cause typhoid fever. He said sewage may flow long distances in streams without mixing with the stream. Little cities, ten miles below Detroit, have had typhoid fever, which he attributed to pollution of the water supply by sewage of Detroit. Dr. Vaughan said he thought we had many kinds of typhoid fever due to different germs. He had failed to find Eberth's germ in water that had caused typhoid. He said he did believe that one case of typhoid fever will produce another, but not that every case must have a preceding case. He considered it a dangerous theory to teach that water must be specifically contaminated to produce typhoid fever. We should teach that filth in itself is dangerous.

The committee on Consumption presented the following preliminary report:

To the President and Members of the Conference of State Boards:

GENTLEMEN:—Your committee begs leave to report the following resolutions:

1. That it is the opinion of this Conference that tuberculosis is a zymotic disease; that its germs are developed within the blood and tissues of man and various animals, and that these germs are capable of an existence external to the body for a number of months, especially in dried sputum, and in places where least exposed to the free action of the atmosphere and sunlight

2. That the germs of tuberculosis are conveyed in various ways to persons and animals, the principal media of these being:

- (a.) Dust containing dried sputum.
- (b.) Food, either contaminated with infected particles, or the flesh of tuberculous animals.
- (c.) Milk from phthisical mothers and tuberculous cows.

3. That unsanitary conditions are the prime factors tending to the development and dissemination of the disease, such as:

- (a.) House and soil dampness.
- (b.) Lack of sunlight and bad ventilation.
- (c.) Bad plumbing and house drainage.

(d.) Over-crowding in living rooms, in schools, in workshops, in public institutions, etc.

4. That the disease is undoubtedly disseminated through the neglect to destroy or disinfect the sputa of the phthisical, distributed as this infectious matter is.

(a.) On infected linen (dangerous to washer-women), clothing, carpets, etc.

(b.) On the floors and walls of houses, workshops, hospitals and hotels, especially of health resorts.

5. That to limit the spread of tuberculosis it is necessary that notification by physicians and householders of its existence be made compulsory, thereby enabling health authorities to examine into the sanitary surroundings of those affected, and to make provision for the adoption of the necessary precautions against infection to the healthy.

6. That municipal inspection of dressed meat and of dairy cattle be systematically carried out, and that the notification of the health authorities by owners of infected animals be made compulsory.

7. That municipal and state governments ought to aid in the work of limiting the disease by the establishment of institutions especially designed for the reception and treatment of the phthisical, and so situated that while minimizing the danger to the general community, they may likewise supply means for outdoor work and exercise, suited to the condition of different patients.

PETER H. BRYCE, M. D., *Ch'm.*

LUCIEN F. SALOMON, M. D.

PROF. V. C. VAUGHAN.

The President announced that the committee on the Pollution of Rivers, would be constituted as follows: Dr. L. F. Salomon, of Louisiana, Dr. C. A. Lindsley, of Connecticut, Dr. C. N. Metcalf, of Indiana, Dr. John H. Rauch, of Illinois and Dr. Henry P. Walcut, of Massachusetts.

Dr. Bryce, as a delegate of the Conference to the International Congress of Forestry, held at Montreal, Quebec, submitted a report.

It was voted to continue all standing committees, and request them to report at the next meeting.

Adjourned *sine die*.

APPENDIX II.

MANUAL

OF THE

HEALTH LAWS OF OHIO,

FOR THE USE OF

BOARDS OF HEALTH,

CONTAINING THE

STATUTES RELATING TO THE PUBLIC HEALTH,
AND THE DECISIONS OF THE SUPREME
COURT IN REFERENCE TO THE
SAME SUBJECT,

In Effect January 1, 1892.

COMPILED BY THE
STATE BOARD OF HEALTH.

INTRODUCTION.

This manual contains all the statutes relating to the public health in force January 1, 1892, and has been prepared specially for the use of health officers and boards of health.

The syllabus adopted in the Revised Statutes of 1890 has been followed, and is placed at the heads of sections, printed in bold-face type, so that the nature of each section may be seen at a glance. The sectional numbering adopted in the Revised Statutes for 1890 (Smith and Benedict) has also been followed where possible. Following each section is, first, its number in the Revised Statutes, where given, and then, separated by a semi-colon, the number of the volume and page of the Ohio Laws where it may be found. The date of the enactment of the laws of 1889-90, 1890-91, not contained in the Revised Statutes, is first given, followed, after a semi-colon, by the number of the volume and page of the Ohio Laws.

Sections are numbered consecutively from one to two hundred and ninety-six, and the *index* refers to the sectional numbering prepared for this volume.

Where a sectional number, given in the text of sections does not refer to a sectional number of the Revised Statutes, but to the sectional number of an act, the proper number given in the Revised Statutes, where possible, is inserted immediately following in brackets.

Great care has been taken in the compilation, and the acts given are believed to be absolutely correct.

C. O. PROBST, M. D.,
Secretary State Board of Health.

MANUAL
OF THE
HEALTH LAWS OF OHIO.

IN FORCE JANUARY 1, 1892.

DIVISION I.

Relating to Boards of Health.

STATE BOARD OF HEALTH.

SEC. 1. [Appointment of state board of health; terms of members; vacancies.] The governor, with the advice and consent of the senate, shall appoint seven persons, who (with the attorney-general, who shall be ex-officio a member of said board) shall constitute the state board of health; provided, that the terms of office of the seven first appointed shall be so arranged that the term of one shall expire on the 13th day of December of each year, and the vacancies so created, as well as all vacancies occurring otherwise, shall be filled by the governor, with the advice and consent of the senate; and provided, also, that appointments made when the senate is not in session, may be confirmed at its next ensuing session. (8035-294; 83 v. 77.)

SEC. 2. [General duties of board.] The state board of health shall have the supervision of the interests of the health and life of the citizens of the state, and may make such quarantine and sanitary rules and regulations as they may deem necessary therefor; they shall make careful inquiry in respect to the causes of disease, and especially the invasion or spread of any infectious or contagious [,] epidemic or epidemic [endemic] disease, and investigate the sources of mortality, and the effects of localities, employments, conditions, ingesta, habits and surroundings on the health of the people, and shall investigate the causes of diseases occurring among the stock and domestic animals of the state, the methods of remedying the same by quarantine or otherwise, and shall gather information in respect to such matters and kindred subjects for dissemination among the people. They shall advise officers of the government, or other state boards in regard to the location, drainage, water supply, disposal of excreta, heating and ventilating of public buildings. They shall collect and preserve such information relating to forms of disease and death as may be useful in the discharge of the duties of said board. It shall be the duty of all local boards of health, health authorities and officials, officers of state institutions, police officers, sheriffs, constables, and all other officers and employes of the state, or any county, city or town thereof, to enforce such quarantine and sanitary rules and regulations as may be adopted by the state board of health, and in the event of failure or refusal on the part of any member of said boards or other officials, or persons in this section

mentioned to so act, he or they shall be subject to a fine of not less than fifty dollars, upon first conviction, and upon a conviction of second offense of not less than one hundred dollars. (8035-295; 86 v. 223.)

SEC. 3. [Vital statistics.] The board of health shall have supervision of the state system of registration of births and deaths as hereinafter provided; they shall make up such forms and recommend such legislation as shall be deemed necessary for the thorough registration of vital and mortuary statistics throughout the state. The secretary of the board shall be the superintendent of such registration. The clerical duties and the safe-keeping of the bureau of vital statistics thus created shall be provided by the secretary of state. (8035-296; 83 v. 78.)

SEC. 4. [Reports to board of contagious diseases.] It shall be the duty of boards of health, health authorities or officials, and of physicians in localities where there are no health authorities or officials, to report to the state board of health, promptly upon discovery thereof, the existence of any one of the following diseases which may come under their observation, to-wit: Asiatic cholera, yellow fever, small-pox, scarlet fever, diphtheria, typhus and typhoid fever, and of such other contagious or infectious diseases as the state board may from time to time specify. (8035-297; 83 v. 78.)

SEC. 5. [Penalties; how applied.] All amounts recovered under the penalties herein provided, shall be appropriated to a special fund for the carrying out of the objects of this law. (8035-298; 83 v. 78.)

SEC. 6. [Meetings of board; conduct of business.] The first meeting of the board shall be within thirty days after their appointment, and thereafter in January and June of each year, and at such other times as the board shall deem expedient. There shall not be more than three called sessions of the board in [any] one year, and no session of the board shall continue longer than three days. The meeting in January of each year shall be in Columbus. A majority shall constitute a quorum. They shall choose one of their number to be president, and they may adopt rules and by-laws for their government, subject to the provisions of this act. (8035-299; 83 v. 78.)

SEC. 7. [Secretary of board; his salary; compensation of members.] They shall elect a secretary, who shall perform the duties prescribed by the board and by this act, and who shall, upon cause, be removed by a majority vote; he shall receive a salary, not to exceed sixteen hundred dollars (\$1,600) per annum, which shall be fixed by the board; he shall also receive his traveling and other expenses incurred in the performance of his official duties. The other members of the board shall receive five dollars per day, and their traveling and other expenses while employed on business of the board. The president of the board shall, quarterly, certify the amount due the members, and on presentation of his certificate the auditor of state shall draw his warrant on the treasurer for the amount. (8035-300; 83 v. 78.)

SEC. 8. [Annual report of board.] It shall be the duty of the board of health to make an annual report, through their secretary or otherwise, in writing, to the governor of the state, on or before the first day of November of each year, and such report shall include so much of the proceedings of the board, and such information concerning vital statistics, such knowledge respecting diseases, and such instructions on the subject

of hygiene as may be thought useful by the board for dissemination among the people, with such suggestions as to legislative action as they may deem necessary. (8035-301; 83 v. 78.)

SEC. 9. [Board of health; how established and constituted in certain municipalities.] The council of each city and village having a population of five hundred or more shall establish a board of health; such board shall be composed of the mayor, who shall be president by virtue of his office, and six members to be appointed by the council, not more than two of whom shall be medical practitioners, who shall serve without compensation, and a majority of whom shall constitute a quorum. Provided that none of the provisions of this section shall apply to cities of the first grade of the first class or to cities of the first grade of the second class. (1890, April 25: 2113; 87 v. 296.)

The council of a village passed an ordinance establishing a board of health, and regularly appointed members of the board, who qualified and acted as such. But the ordinance establishing the board was not read three times, nor were the yeas and nays suspending the rules recorded: Held, that they were such board *de facto*, and their acts within the sphere of their office are valid and binding. *Smith v. Lynch*, 290 ¶ 261.

SEC. 10. [Term of office of members.] The term of office of the members of the board shall be three years from the date of appointment, except that those first appointed shall be classified as follows: Two to serve for three years, two for two years, and two for one year, and thereafter two shall be appointed annually. (2114; 66 v. 201.)

SEC. 11. [Board shall appoint health officer; may appoint clerk, etc.] The board shall appoint a health officer, who shall furnish his name and address and such other information as may be required by the state board of health; and may appoint a clerk, as many ward or district physicians as it may deem necessary for the care of the sick poor, and such other persons as may be in need, and define their duties and fix their salaries; and all such appointees shall serve during the pleasure of the board. (2115; 85 v. 59-60.)

SEC. 12. [Suppression of nuisances by boards of health; registration of marriages, births and deaths, etc.] The board of health may abate and remove all nuisances in the corporation, and assess the costs and expenses of the same upon the property wherein such nuisance is situated, which assessment when duly certified by the president of the board to the county auditor, shall become a lien, to be collected as other taxes in favor of the corporation; compel the owners, agents, assignees, occupants, or tenants of the lot, property, house or building upon or in which any nuisance may be, to abate and remove the same; regulate the construction, arrangement, emptying, and cleaning of all water-closets and privy-vaults; create a complete and accurate system of registration of births, marriages, deaths, and interments occurring in such corporation, for the purposes of legal and genealogical investigations, and to furnish facts for statistical, scientific, and particularly for sanitary inquiries; and when complaint is made, or a reasonable belief exists, that an infectious or contagious disease prevails in any locality or house, the board may visit such locality or house, make all necessary investigations by inspection, and on discovering that such infectious or contagious diseases exist, send the persons so diseased to the pest-house or hospital. (2116; 71 v. 159.)

SEC. 13. [Registry of births, marriages and deaths in Cincinnati.] In cities of the first grade of the first class, which, for this purpose alone,

shall be co-extensive with the county, it shall be the duty of physicians and professional midwives to keep a registry of the several births at which they have assisted professionally, which registry shall contain the time of such birth, sex, and color of the child, and the names and residence of the parents. Clergymen and other persons authorized to solemnize marriages, shall keep a registry of all marriages solemnized by them. Physicians who have attended deceased persons in their last illness, and undertakers and sextons who have buried deceased persons, shall keep a registry of the name and age of such persons, and their residence at the time of their death; and all such physicians, professional midwives, clergymen, and all persons authorized to solemnize marriages, undertakers and sextons, shall report to the board of health all births, marriages and deaths occurring within the limits of such city, as registered by them, which reports shall be made as often as the board of health may require. (2117; 82 v. 177.)

SEC. 14. [Duty of physicians, house-owners, etc., to give notice of prevalence of infectious diseases.] The owner, or agent of the owner, of a house in which a person resides who has the small-pox, or any other disease dangerous to the public health, and the physician called to attend the person so affected, shall, within twenty-four hours after becoming cognizant of the fact, give notice thereof to the board of health; and when a person, so affected, is removed to a pest-house, or hospital, the board of health is empowered to use all necessary means to restrain him of his liberty, until the danger of infection, or contagion, from such disease, ceases. (2118; 71 v. 159.)

SEC. 15. [Permit to convey corpse.] No person shall convey a corpse to or from any city, without a permit from the board of health. (2119; 71 v. 159.)

SEC. 16. [Health provisions; penalty for non-compliance.] Any person other than an officer, who fails to faithfully comply with any of the provisions of the four preceding sections, shall pay a fine not exceeding fifty dollars. (2120; 83 v. 154.)

SEC. 17. [Punishment of infected person for escaping, etc.] A person removed to a pest-house, or hospital, who willfully leaves or escapes therefrom, before the physician thereof issues a certificate of restored health, shall be fined not less than five, nor more than fifty dollars, or imprisoned not less than one, nor more than ten days. (2121; 66 v. 201.)

SEC. 18. [Powers of boards of health.] The council may grant power to the board of health to make such orders and regulations as it may deem necessary for the public health and for the prevention of disease, and such orders and regulations shall have all the force and effect of ordinances of the corporation, and the council of cities of the second grade of the first class, and the council of cities of the third and fourth grade, second class, may grant power to the board of health to employ such number of scavengers for the removal of swill, garbage and offal from the houses, buildings, yards, and lots within the city as it may deem necessary. (1891, March 3; 2122; 88 v. 71.)

SEC. 19. [Duty as to Brothels, etc.] The board of health, in cities of the first class, and, when empowered by resolution of the council, in cities of the second class, are authorized and directed to enter brothels, and houses of assignation, and make enumerations, as often as they may deem necessary, of the name, age and color of the inmates therein, and

make a record thereof, in a book to be kept in the office of the board of health, open to the inspection of the members of the board, the police, and others. (2123; 66 v. 201.)

SEC. 20. [**Disposition of minor prostitute.**] When a female, under the age of eighteen years, or believed to be under that age, is found in such brothel, or house of assignation, it shall be the duty of the board of health to return her to her home, if she has a home; and if such female has no home, then she shall be consigned to the house of refuge and correction of the corporation, or such benevolent institution, established for the reformation of abandoned females, as the board of health may elect. (2124; 66 v. 202.)

SEC. 21. [**When females shall be treated as a vagrant.**] No such female shall be consigned to a house of refuge and correction, or benevolent institution, against her will; but in case she declines the care and protection tendered her, it shall be the duty of the board to report her to the mayor, or police court, forthwith, to be tried as a vagrant. (2125; 66 v. 202.)

SEC. 22. [**Treatment of diseased female; expense thereof.**] When a female is found in a house of ill-fame, or assignation, affected with contagious or infectious disease, and is removed to, or if such person apply for admission to, any hospital, or pest-house, for treatment, the costs of such removal, and the expense of boarding and washing, while in such hospital, or pest-house, shall be paid by the proprietor of the house of ill-fame, or assignation, from which such patient is removed, or in which she was last an inmate; such payment shall be made before the patient is discharged from such hospital, or pest-house; and the expense of boarding, washing, and medical attendance, shall be a lien upon the house and premises in which such female shall have been so found, which lien may be enforced as other liens for the security of money. (2126; 66 v. 202.)

SEC. 23. [**Suit for recovery of such expense.**] If the proprietor of such house of ill-fame, or assignation, fails or refuses to pay such expense, legal proceedings shall be immediately instituted against him, and such patient shall be held as a witness in the case. (2127; 66 v. 202.)

SEC. 24. [**Nuisances to be abated.**] When any building, erection, excavation, premises, business, pursuit, matter, or thing, or the sewerage, drainage, or ventilation thereof, is, in the opinion of the board of health, in a condition dangerous to life or health, the board shall declare the same, to the extent it may specify, a public nuisance, or dangerous to life and health; and the board may order the same to be removed, abated, suspended, altered, or otherwise improved or purified, as in the order shall be specified, and shall cause the order, before its execution, to be served on the agent, owner, occupant, or tenant, or such of them as are in the corporation, and can be found. (2128; 66 v. 202.)

SEC. 25. [**Temporary suspension of order or abatement.**] If a party so served, before the execution of the order is commenced, apply to the board to have the order or its execution stayed or modified, it shall be the duty of the board to temporarily suspend or modify it, and to give the party, as the case, in the opinion of the board, may require, a reasonable and fair opportunity to be heard before the board, and to present proofs and facts against the declaration and the execution of the order, or in favor of its modification. (2129; 66 v. 202.)

SEC. 26. [**Modification or re-affirmation of order.**] The board shall enter upon its minutes such facts and proofs as it may receive, and

its proceedings on the hearing, and thereafter may rescind, modify, or reaffirm its former declaration and order, and require execution of the original or of a new or modified order, in such form as it may finally determine. (2130; 66 v. 203.)

SEC. 27. [**Appointment of sanitary police by board of health.**] The board of health shall have power to appoint as many persons for sanitary duty as in its opinion the public health and sanitary condition of the corporation may require; and such persons shall have general police powers, be known as the sanitary police, perform such duties for the promotion of the public health, and such other duties as the board of health may direct, and shall serve during the pleasure of the board. (2131; 71 v. 160.)

SEC. 28. [**Appointment of sanitary police. Powers, duties and salaries.**] In all cities of the second grade of the first class, the board of health shall have power to appoint as many persons for sanitary duty as in its opinion the public health and sanitary condition of the corporation may require, not exceeding one for each ten thousand inhabitants, as shown by the last police census in such cities; but the board shall have the power in cases of emergency, to appoint as many special sanitary police as it may think proper, and such appointees as special police shall serve during the pleasure of the board: and all such persons shall have general police powers, be known as sanitary police, shall be electors of such cities, and perform such duties as the board of health may direct; and for such services shall receive a salary, fixed by the board, of not less than seven hundred and eighty dollars per annum. Provided, that the sanitary police now in office shall not be removed except in the manner provided for by sec. 2132-*u*. (2131*a*; 85 v. 60.)

SEC. 29. [**When such police shall be dismissed.**] When, in the opinion of the board of health, the services of a member of the sanitary police is no longer required, he shall, on recommendation of the board of health, be returned to duty as a regular policeman, or be dismissed, as the mayor, or, in cities of the first and second grades of the first class, and cities of the first grade of the second class, the police commissioners may direct. (2132; 66 v. 203.)

SEC. 30. [**Removals and suspensions generally.**] In all cities of the second grade of the first class, the board of health may, for cause to be assigned, on a public hearing, on due notice, and by the vote of a majority of all members elected, according to rules promulgated by it, remove or suspend from office, or for any definite time deprive from pay, any member of such sanitary police force or any employe of such board; and no employe of such board of health shall be dismissed for other reasons; it may make rules and regulations for the government and discipline of the employes, and cause the same to be published. (2132*a*; 85 v. 60.)

SEC. 31. [**Milk, meat, butter, and cheese inspectors.**] The board of health may appoint such number of inspectors of milk and meat, and such number of inspectors of butter and cheese, and substances purporting to be butter or cheese, or having the semblance of butter or cheese, and as many market-masters and such other persons as may be necessary to carry out the provisions of this chapter, define their duties and fix their compensation; and such inspectors of milk shall keep, for public inspection, a record of the names and places of business of all persons engaged in the sale of milk. (2133; 78 v. 188.)

SEC. 32. [Places where milk, butter, cheese, etc., are made subject to inspection. Analysis of milk, butter.] All dairies, including the cows, cow-stables, milk-houses, and milk-vessels, the owners of which offer for sale within the limits of the corporation milk or butter manufactured by such owners, shall be subject to inspection by the inspectors, and also any manufactory of butter or cheese, or of substances having the semblance of butter or cheese, or places where such substances or either of them are sold, shall be subject to inspection by the inspectors; that officer may enter any place where milk is sold or kept for sale, and all carriages used for the conveyance of milk within the corporate limits; and also any manufactory or place where butter or cheese, or substances having the semblance of butter or cheese are manufactured, or any place where such substances are sold or kept for sale within the corporate limits; and whenever he has any reason to believe milk found therein is impure or adulterated, or any butter or cheese, or substances having the semblance of butter or cheese found therein contain any impure, unwholesome or deleterious substance, or is being sold or offered for sale under any false or deceptive name or designation, that any butter or cheese not made from pure cream or milk, or any substance having the semblance of butter or cheese, is being sold or offered for sale, without being branded or stamped, as required by section 7090, he shall take specimens thereof and subject them to satisfactory tests; or, if the board of health so direct, to chemical analysis, the result of which he shall record and preserve as evidence, and a certificate of such result, sworn to by the analyst, shall be admissible in evidence in all prosecutions under this chapter, or any law of this state. (2134; 78 v. 188.)

SEC. 33 [Powers of board of health; gratuitous vaccination, etc.] The board of health may take measures and supply agents, and afford inducements and facilities for gratuitous vaccination and disinfection, may afford medical relief to and among the poor of the corporation as in its opinion the protection of the public health may require, and during the prevalence of any epidemic may provide temporary hospitals for such purposes; and the said board is hereby required to inspect semi-annually, and oftener if in the judgment of the board, it shall be deemed necessary, the sanitary condition of all schools and school buildings within the limits of the corporation. (2135; 80 v. 60.)

SEC. 34 [Sanitary reports, its contents, etc.] It shall be the duty of the board of health, on or before the first Monday of March in each year, to make a report, in writing, to the council of the corporation, upon the sanitary condition and prospects of such city or village, which report shall contain the statistics of deaths, the action of the board and its officers and agents, and the names thereof for the past year; and it may contain other useful information, and the board shall suggest therein any further legislative action deemed proper for the better protection of life and health. (2136; 66 v. 203.)

SEC. 35. [Penalty for violating order of board of health.] Whoever violates any provision of this chapter, or any order of the board of health made in pursuance thereof, or obstructs or interferes with the execution of any such order, or willfully and illegally omits to obey any such order, shall be fined in any sum not exceeding one hundred dollars, or imprisoned for any time not exceeding ninety days, or both; but no person shall be imprisoned under this section for the first offense. (2137; 66 v. 203.)

SEC. 36. [Violation by a corporation.] If such violation, obstruction, interference, or omission be by a corporation, it shall forfeit and pay to the proper city or village, any sum not exceeding one hundred dollars, at the discretion of the court, to be collected in a civil action brought in the name of such city or village; and any officer of such corporation consenting to such violation, shall be subject to imprisonment as above provided. (2138; 66 v. 204.)

SEC. 37. [Prosecutions, how instituted.] Prosecutions under this chapter, and the civil action provided for in the preceding section, shall be instituted before any tribunal within the municipal corporation having jurisdiction thereof. (2139; 66 v. 204.)

SEC. 38. [Provision for expenses of board of health.] When expenses are incurred by the board of health, under the provisions of this chapter, it shall be the duty of the council, upon application and certificate from the board of health, to pass the necessary appropriation ordinances to pay the expenses so incurred and certified; and the council is hereby empowered to levy, subject to the restrictions contained in the ninth division of this title, and set apart, the necessary sum to carry into effect the provisions of this chapter. (2140; 71 v. 160.)

SEC. 39. [Board of police commissioners in certain cities to act as board of health.] In cities of the third grade of the first class and in cities of the first grade of the second class, there shall be no board of health, but the board of police commissioners in such cities shall exercise all the powers and perform all the duties of the boards of health and mayors as provided in this chapter. (1890, March 26; 2141; 87 v. 118.)

SEC. 40. [Health officers of cities or villages may establish quarantine stations.] Any city or village having a board of health, or "the standing committee on health of any city or village council, who may do and perform all the duties of a board of health, as prescribed in this chapter," or a health officer may establish a quarantine ground or grounds, within or without its own limits; but if such place be without its limits, and within the limits of any other municipal corporation, the consent of the corporation within the limits of which it is proposed to establish such quarantine shall be first obtained. (2142; 79 v. 53.)

SEC. 41. [Railroads, vessels, etc., may be subjected to quarantine.] The board of health or the health officer may, in times of epidemics, or threatened epidemics, establish a quarantine on vessels, railroads, or any class of vehicles used for the purpose of transporting passengers, baggage, or freight, may make such rules or regulations as may be deemed wise and necessary for the protection of the health of the people of the community or state. (2143; 76 v. 69.)

SEC. 42. [Effect of declaring quarantine.] Whenever quarantine is declared, all railroad and steamboat corporations, and the owners, consignees, or assignees of any railroad, steamboat, stage, or other vehicle used for the transportation of passengers, baggage, or freight, shall submit to any rules or regulations imposed by such board of health or health officer; they shall submit to any examination required by the health authorities respecting any circumstance or event touching the health of the crew and passengers, and the sanitary condition of the baggage and freight; and any owner, consignee, or assignee, or other person interested as aforesaid, who makes any unfounded declaration respecting the points under examination, shall, upon conviction thereof before any court or justice of the peace, be fined not more than one hundred dollars or imprisoned not

more than six months, or both; and all fines thus collected, less costs, shall be turned over to the sanitary fund of the city or village where such quarantine may be established. (2144; 76 v. 69.)

SEC. 43. [To whom and what quarantine rules shall apply.] All rules and regulations passed by the board of health or health officer, shall apply to all persons, goods, or effects arriving by railroad, steamboat, or other vehicle of transportation, after quarantine is declared. (2145; 76 v. 69.)

SEC. 44. [Needful buildings may be erected.] The board of health or health officer shall be authorized to erect any temporary wooden buildings or field hospitals deemed necessary for the isolation and protection of persons or freight supposed to be infected; but such place shall be constantly guarded by a competent force of at least three sanitary officers. (2146; 76 v. 69.)

SEC. 45. [Sanitary inspectors may be appointed.] The board of health or health officer may appoint, during the time of quarantine, a sufficient number of sanitary inspectors, the salaries of whom shall be fixed by the council. (2147; 76 v. 69.)

SEC. 46. Power of council to borrow money and levy tax therefor in time of epidemic or threatened epidemic.] In case of any epidemic or threatened epidemic, the council shall have power to borrow until such times as the next levy and collections thereof be made, and at a rate of interest not to exceed six per cent., any sum of money that the board of health and council may deem necessary to defray the expenses of the aforesaid quarantine. (2148; 76 v. 69.)

SEC. 47. [Right of visitation.] The general assembly of Ohio, by a committee, the governor of the state, the council of the corporation by a committee, the mayor or police judge of the corporation, the board of health of the corporation, the judge of any court of this state, and the grand jury of the county, may, at any time, visit and inspect any of the benevolent or correctional institutions established by any municipal corporation, and examine the books and accounts of the same. (1544; 66 v. 272.)

DIVISION II.

Relating to Nuisances.

SEC. 48. [Powers of municipal corporations to fill lots, remove obstructions, etc.] All municipal corporations shall have power to cause any lot of land within their limits on which water at any time becomes stagnant, to be filled up or drained, and to cause all putrid substances to be removed from any lot, and to cause the removal of all obstructions from all culverts or covered drains on private property, laid in any natural water-course, creek, brook or branch where the same obstructs the water naturally flowing therein, causing it to flow back or become stagnant, in a way prejudicial to the health, comfort or convenience of any of the citizens of the neighborhood; and if such culverts or drains be of insufficient capacity, to cause the same to be made of such capacity as reasonably to accommodate the flow of such water at all times therein; and the council may direct, by resolution, the owner to fill up or drain such lot, remove such putrid substance, or remove such obstructions, and if necessary enlarge such culverts or covered drains to meet the requirements thereof. (2149; 81 v. 37.)

SEC. 49. [Duty of owner to comply with direction.] It shall be the duty of such owner, or his agent or attorney, after service of a copy of such resolution, or after a publication of the same in some newspaper of general circulation in such corporation for two consecutive weeks, to comply with the directions of the resolution within the time therein specified. (2150; 66 v. 225.)

SEC. 50. [To be done at owner's expense, in case of refusal or neglect, etc.] In case of failure or refusal to comply with the resolution, the work required thereby may be done at the expense of the corporation, and the amount of money so expended shall be recovered from the owner before a justice of the peace, or other court of competent jurisdiction; and such expense shall, from the time of the adoption of the resolution be a lien on such lot, which may be enforced by suit in the court of common pleas of the proper county; and like proceedings may be had as directed in relation to the improvement of streets. (2151; 66 v. 225.)

SEC. 51. [Duty of health officers to enforce provisions of this chapter.] It shall be the duty of the officers connected with the health department of every such municipal corporation, to see that the provisions of this chapter are strictly and promptly enforced. (2152.)

SEC. 52. [Offensive and noisy factories not to be erected or carried on within certain distance of any benevolent institution.] It is unlawful for a person or an incorporated company to erect or carry on, within one hundred and twenty rods of Longview asylum, or any state benevolent institution, any rolling mill, blast furnace, nail factory, copper smelting works, boiler factory, petroleum oil refinery, slaughter house, tallow chand-

lery, or glue, soap, or starch factory, or any other works or business productive of unwholesome or noxious odors or gases, or loud noises, which may annoy or endanger the health, or interfere with the proper treatment of the inmates of such institution; but it is lawful for a person to file his petition in the court of common pleas in any county wherein such an institution is located, setting forth his desire to erect or carry on at less distance than that prohibited herein, naming the precise point, any of the establishments hereinbefore named, or any other works which might have a tendency to generate unwholesome or noxious odors, or in any way annoy or endanger the health or prevent the recovery of inmates of said institution, and the reasons and circumstances, in his opinion, why the erection or carrying on thereof would not so annoy or endanger the health or convenience, or endanger the recovery of the inmates of said institution; and shall give notice in some newspaper of general circulation in such county, of the pendency and prayer of such petition, for at least six consecutive weeks previous to the term of the court next to be held therein, and shall also serve a written notice upon the superintendent of the institution, at least thirty days before the day set for the hearing of the petition; thereupon, if, upon the hearing of the petition, it appears that due notice has been given, as herein required, and the court is of opinion that there exists no good reason why such establishment may not be so erected or carried on, and that by the erection or carrying on thereof at the point named, such institution will sustain no detriment, the court may issue an order granting the prayer of the petitioner; and thereafter he may proceed to locate such establishment or carry on such business at the point named in his petition, the same as if this section had not been passed. (624; 63 v. 96.)

SEC. 53. [Corporations may be prosecuted for nuisance; court to order nuisance abated.] Corporations may be prosecuted by indictment for violation of any of the provisions of sections 6921, 6922, 6923, 6924, 6925 and 6926 and in every case of conviction under said sections the court shall adjudge that the nuisance described in the indictment be abated or removed, and may issue an order to the sheriff to execute such judgment at the cost and expense of the defendant. (6919; 54 v. 130.)

SEC. 54. [When certain nuisances deemed to have been committed; continuance of, a separate offense.] An offense charged under either of said sections shall be construed and held to have been committed in any county whose inhabitants are or have been injured or aggrieved thereby; and the continuance of any nuisance for five days after prosecution commenced therefor shall be deemed an additional offense. (6920; 63 v. 102.)

SEC. 55. [Inspector of nuisances; when and by whom appointed; powers, duties, etc.] The county commissioners of any county, whenever there is a violation of any of the provisions of either of said sections named in section 6919, are authorized to employ and reasonably compensate, at such times as they may deem proper, one inspector of nuisances who shall be vested with police powers, and shall be authorized to examine all cases of violation of the provisions of said sections, and for such purpose and for the purpose of obtaining evidence, he shall be fully authorized and empowered to enter upon the premises of any person in any county, and it shall be the duty of such inspector to make or cause to be made a complaint and to institute prosecution against any person or corporation violating the provision of either of said sections, and such in-

spector shall not be required in the prosecution of any such proceeding to give security for costs. (1890, April 28: 6920a; 87 v. 350.)

SEC. 56. [Prosecuting attorney made legal advisor of inspector; compensation.] The prosecuting attorney shall be the legal advisor of such inspector and the attorney in all such prosecutions, and in lieu of any percentage on fines and costs, he shall be allowed a compensation for such services by the county commissioners, to be paid out of the county treasury. (1890, April 28: 6920b; 87 v. 351.)

SEC. 57. [Judgment for fine and costs: how collected.] A judgment for fine and costs rendered against any person or corporation for the violation of the provisions of either of said sections mentioned in said section 6919, when the defendant has no property, or when the defendant has not a sufficient amount of property within the county upon which to levy to satisfy such judgment and costs, may be enforced and collected in the same manner as judgments are collected in civil cases, upon execution duly issued from any such court to any sheriff of any county of the State. (1890, April 28: 6920c; 87 v. 351.)

SEC. 58. [Summons and indictment against corporations.] When an indictment is presented against a corporation, a summons commanding the sheriff to notify the accused thereof, and returnable on the seventh day after its date, shall issue on the precept of the prosecuting attorney; such summons, together with a copy of the indictment, shall be served and returned in the manner provided for service of summons upon such corporation in civil actions; and if the service can not be made in the county where the prosecution began, then the sheriff may make service in any county of the state upon either its president, secretary, superintendent, clerk, cashier, treasurer, managing agent, or other chief officer, or by a copy left at any general or branch office, or usual place of doing business of such corporation, with the person having charge thereof; the corporation, on or before the return day of a summons duly served, may appear by one of its officers, or by counsel, and answer to indictment by motion, demurrer or plea, and upon its failure to make such appearance and answer, the clerk shall enter a plea of "not guilty;" and upon such appearance being made, or plea entered, the corporation shall be deemed thenceforth continuously present in court until the case is finally disposed of. (1890, April 28: 7231; 87 v. 351.)

SEC. 59. [Nuisances.] Whoever erects, continues, uses, or maintains, any building, structure, or place for the exercise of any trade, employment, or business, or for the keeping or feeding of any animal, which, by occasioning noxious exhalations, or noisome or offensive smells, becomes injurious to the health, comfort, or property of individuals, or the public, or causes or suffers any foul, filthy, or noisome substance to be collected, or to remain, in any place, to the damage or prejudice of others, or the public, or obstructs or impedes, without legal authority, the passage of any navigable river, harbor, or collection of water, or corrupts, or renders unwholesome or impure, any water-course, stream, or water, or unlawfully diverts any such water-course from its natural course or state, to the injury or prejudice of others, or obstructs or incumbers, by fences, buildings, structures, or otherwise, any public ground or highway, or any street or alley of any municipal corporation, shall be fined not more than five hundred dollars. (6921; 72 v. 112.)

SEC. 60. [Creating artificial ponds and stagnant waters.] Whoever builds, erects, continues, or keeps up, any dam or other obstruction, in

any river or stream of water, and thereby raises an artificial pond, or produces stagnant water, which is manifestly injurious to the public health and safety, shall be fined not more than five hundred dollars. (6922; 29 v. 144.)

SEC. 61. [Unlawful deposit of dead animals, offal, etc., into or upon land or water.] Whosoever puts the carcass of any dead animal, or the offal from any slaughter-house, or butcher's establishment, packing-house, or fish-house, or any spoiled meat, or spoiled fish, or any putrid substance, or the contents of any privy vaults, upon or into any lake, river, bay, creek, pond, canal, road, street, alley, lot, field, meadow, public ground, market space or common, and whoever being the owner or occupant of any such place, knowingly permits any such thing to remain therein, to the annoyance of any of the citizens of this state, neglects or refuses to remove or abate the nuisance occasioned thereby, within twenty-four hours after knowledge of the existence of such nuisance upon any of the above described premises, owned or occupied by him, or after notice thereof in writing, from any supervisor, constable, trustee or health officer of any municipal corporation or township in which such nuisance exists, or from a county commissioner of such county, shall be fined not more than fifty dollars nor less than ten dollars, and pay the cost of prosecution, and in default of the payment of said fine and costs, be imprisoned not more than thirty days, but the provisions hereinbefore made shall not prohibit the depositing of the contents of privy vaults and catch basins into trenches or pits not less than three (3) feet deep, excavated in any lot, field or meadow, the owner thereof consenting outside the limits of any municipal corporation, and not less than thirty rods distant from any dwelling, well or spring of water, lake, bay or pond, canal, run, creek, brook or stream of water, public road or highway; provided, said contents deposited in said trenches or pits are immediately thereafter covered with dry earth to the depth of at least twelve inches; nor shall said provisions prohibit the depositing of said contents into furrows situate and distinct, as specified for said trenches or pits; provided, the same are immediately thereafter wholly covered with dry earth by plowing or otherwise; and provided, also, that the owner or occupant of the land in which said furrows are plowed consents, and is a party thereto; provided, also, that the board of health of any municipal corporation may allow said contents to be deposited within the corporate limits into trenches or pits or furrows, situate, distant and to be covered as aforesaid. (1890, April, 20: 6923; 87 v. 349.)

SEC. 62. [Certain business and buildings are nuisances when near state benevolent institutions.] Whoever carries on the business of slaughtering, or tallow chandlery, or manufacturing glue, soap, starch, or other article, the manufacture of which is productive of unwholesome or noxious odors, in any building or place within one mile of Longview asylum, or any of the state benevolent institutions, or erects, within one hundred and twenty rods of any state benevolent institution, any rolling-mill, blast furnace, nail factory, copper smelting works, boiler factory, petroleum oil refinery, or any other works which may generate unwholesome or noxious odors, or make loud noises, or which may annoy, or endanger the health or prevent the recovery of the inmates of any such institution, shall be fined not more than five hundred nor less than one hundred dollars; all property, real or personal, which is used with the knowledge of the owner thereof in violation of this section, shall be liable for the fines and costs assessed for such violation, without exemption. (6924; 63 v. 96.)

SEC. 63. [Permitting emptying of coal dirt, petroleum, etc., into rivers, etc.; penalty.] Whoever intentionally throws or deposits or permits to be thrown or deposited, any coal dirt, coal slack, coal screenings, or coal refuse from coal mines, or any refuse or filth from any coal oil refinery or gas works, or any whey or filthy drainage from a cheese factory, upon or into any of the rivers, lakes, ponds, or streams of this state, or upon or into any place from which the same will wash into any such river, lake, pond or stream; or whoever shall, by himself, agent or employe, cause, suffer or permit any petroleum or crude oil, or refined oil or refuse matter or filth from any oil well, or oil tank, or oil vat, or place of deposit of crude or refined oil, to run into, or be poured, or emptied, or thrown into any river, or ditch, or drain, or water course, or into any place from which said petroleum, or crude oil, or refuse matter, or filth or refined oil may run or wash, or does run or wash into any such river, or ditch, or drain, or water-course, shall be fined in any sum not more than one thousand dollars nor less than fifty dollars; and such fine and costs of prosecution shall be and remain a lien on said oil well, oil tank, oil refinery, oil vat and place of deposit, and the contents of said oil well, oil tank, oil refinery, oil vat or place of deposit, until said fine and costs are paid; and said oil well, oil tank, oil refinery, oil vat or place of deposit, and the contents thereof, may be sold for the payment of such fine and costs, upon execution duly issued for that purpose. (1890, April 28: 6925; 87 v. 351.)

SEC. 64. [Obstructing ditch, drain or water-course.] Whoever willfully obstructs any ditch, drain or water-course constructed by proceedings before any board of county commissioners or township trustees, or diverts the water therefrom, shall be fined not more than one hundred nor less than ten dollars. (6926; 72 v. 150.)

SEC. 65. [Befouling well, spring, etc.] Whoever maliciously puts any dead animal, carcass, or part thereof, or any other putrid, nauseous, noisome, or offensive substance, into, or in any manner befouls, any well, spring, brook, or branch of running water, or any reservoir of water-works, of which use is or may be made for domestic purposes, shall be fined not more than fifty nor less than five dollars, or imprisoned not more than sixty days, or both. (6927; 70 v. 12.)

If an individual erects a mill-dam which causes disease and sickness, he is responsible to individual sufferers in an action on the case for a nuisance. In such a case it is no defense that the injury affects the whole neighborhood. Nor is the civil remedy merged by an indictment and conviction. [Story v. Hammond, 4 O. R., 376.]

A city erecting and controlling a work house is liable in damages for the corruption of a water course into which it has run the sewage of the institution, just as a private individual would be liable. [Cleveland v. Beaumont, 4 Bull. 345; 2 Clev. Rep. 172.]

The power of creating municipal corporations necessarily implies authority to confer upon them such police powers as may be necessary for their internal government; and a resolution under the municipal act of 1852 directing lot owners "to fill and drain their lots in such manner as shall be necessary to remove all stagnant water," being a reasonable sanitary measure, was not in conflict with the constitution. [Bliss v. Kraus, 16 O. S. 54.]

The judgment required by the statute, upon conviction for maintaining a nuisance, under the act of April 15, 1857, can not be dispensed with upon a showing that the nuisance does not exist at the time of rendering the judgment. The order to abate does not issue as a matter of course. If the nuisance has ceased, the order will not issue. [Smith v. State, 22 O. S. 539; Matthews v. State, 25 O. S. 536.]

A creek known by the name of the Middle Fork of Beaver, and also by the name of the Middle Fork of Little Beaver, is sufficiently described in an indictment by the first name alone. [Bossert v. State, W. 113.]

DIVISION III.

RELATING TO

Food, Drugs and their Adulteration

DAIRY AND FOOD COMMISSIONER.

SEC. 66. [Ohio dairy and food commissioner: election of, salary and expenses.] That there is hereby created the office of dairy and food commissioner of the state of Ohio. Said commissioner shall be elected by the qualified electors of the state of Ohio, under and in pursuance of the general election laws of the state of Ohio, at the general election held on the first Tuesday after the first Monday in November, A. D. 1891, a dairy and food commissioner who shall take his office on the first Tuesday after the first Monday in May after his election, who shall serve for two years or until his successor is elected and qualified; his salary shall be twelve hundred dollars per year and his necessary and reasonable expenses incurred in the discharge of his official duties under this act, to be paid at the end of each calendar month on presentation of vouchers properly itemized and certified by him to be correct; said expenses to be paid out of the general revenue fund, but not to exceed six hundred dollars in any one year. (1891, May 1: 8035-272; 88 v. 496.)

SEC. 67. [General duties of himself and assistants.] It shall be the duty of said commissioner or assistant commissioner, to inspect any articles of butter, cheese, lard, syrup, or other article of food or drinks, made or offered for sale in the state of Ohio, as an article of food or drink, and to prosecute or cause to be prosecuted, any person or persons, firm or firms, corporation or corporations, engaged in the manufacture or sale of any adulterated article or articles of food or drink, or adulterated in violation of, or contrary to any laws of the state of Ohio. (8035-273; 84 v. 205.)

SEC. 68. [Powers.] The said commissioner, or any assistant commissioner, shall have power in the performance of their duty to enter into any creamery, factory, store, salesroom, drug store or laboratory, or place where they have reason to believe food or drink are made, prepared, sold, or offered for sale, and to examine their books, and to open any cask, tub, jar, bottle or package, containing or supposed to contain any article of food or drink, and examine or cause to be examined and analyzed the contents thereof, and it shall be the duty of any prosecuting attorney in any county of the state, when called upon by said commissioner or assistant commissioner, to render him any legal assistance in his power, to execute the laws, and to assist in the prosecution of cases, arising under provisions of this act. (8035-274; 84 v. 205.)

SEC. 69. [Assistant commissioners. Expert chemists.] Said commissioner may appoint not more than two assistant commissioners, whose salaries shall be one thousand dollars each, per annum, and their necessary and reasonable expenses incurred in the discharge of their official duties, payable in time and manner like that of the commissioner and on itemized vouchers approved by the said commissioner. The said commissioner shall have power to appoint three expert chemists to be of acknowledged standing, ability and integrity, to examine and analyze samples of food and drink, or of drugs or medicines submitted to them by the commissioner or assistant commissioners. The compensation of said expert chemists shall be for the actual number of determinations or examinations required and made, and shall not exceed for each determination or examination two-thirds the price usually paid experts for a single determination or examination of a similar kind. The compensation of said expert chemists shall be paid at the end of each quarter of the calendar year, on itemized vouchers certified to by said commissioner, which said amount of expenses shall not exceed, in any one year for the three expert chemists combined, the sum of one thousand dollars, the sum to be paid out of the general revenue fund. (1891, May 1: 8035-275; 88 v. 497)

SEC. 70. [Fines.] All fines assessed or collected under prosecutions, begun or caused to be begun by the said commissioner or assistant commissioners, shall be paid into the state treasury. (8035-276; 84 v. 205.)

ADULTERATION DEFINED.

SEC. 71. [Adulterated drug or food.] No person shall, within this state, manufacture for sale, offer for sale, or sell any drug or article of food which is adulterated, within the meaning of this act. (7458-7; 81 v. 67)

SEC. 72. [Term drug defined.] The term "drug," as used in this act, shall include all medicines for internal or external use, antiseptics, disinfectants and cosmetics. The term "food," as used herein, shall include all articles used for food or drink by man, whether simple, mixed or compound. (7458-8; 81 v. 67)

SEC. 73. [When drugs and food deemed adulterated.] An article shall be deemed to be adulterated within the meaning of this act:

(a) In the case of drugs: (1) If, when sold under or by a name recognized in the United States Pharmacopœia, it differs from the standard of strength, quality or purity laid down therein; (2) If, when sold under or by a name not recognized in the United States Pharmacopœia but which is found in some other pharmacopœia, or other standard work on materia medica, it differs materially from the standard of strength, quality, purity laid down in such work; (3) If its strength, quality, or purity falls below the professed standard under which it is sold.

(b) In the case of food: (1) If any substance or substances have been mixed with it, so as to lower or depreciate, or injuriously affect its quality, strength, or purity; (2) If any inferior or cheaper substance or substances have been substituted wholly or in part for it; (3) If any valuable or necessary constituent or ingredient has been wholly or in part abstracted from it; (4) If it is an imitation of, or is sold under the name of another article; (5) If it consists wholly, or in part, of a diseased, decomposed, putrid, infected, tainted or rotten animal or veg-

etable substance or article, whether manufactured or not—or, in the case of milk, if it is the produce of a diseased animal; (6) If it is colored, coated, polished or powdered, whereby damage or inferiority is concealed, or if by any means it is made to appear better or of greater value than it really is; (7) If it contains any added substance or ingredient which is poisonous or injurious to health; provided, that the provisions of this act shall not apply to mixtures or compounds recognized as ordinary articles or ingredients of articles of food, if each and every package sold or offered for sale be distinctly labeled as mixtures or compounds, with the name and per cent. of each ingredient therein, and are not injurious to health. (1890, April 22: 7458-9; 87 v. 248.)

SEC. 74. [Sample may be demanded for analysis.] Every person manufacturing, offering or exposing for sale, or delivering to a purchaser, any drug or article of food included in the provisions of this act, shall furnish to any person interested, or demanding the same, who shall apply to him for the purpose, and shall tender him the value of the same, a sample sufficient for the analysis of any such drug or article of food which is in his possession. (7458-10; 81 v. 68.)

SEC. 75. [Penalties.] Whoever refuses to comply, upon demand, with the requirements of section *four* [7458-11], and whoever violates any of the provisions of this act, shall be guilty of a misdemeanor, and upon conviction shall be fined not exceeding one hundred dollars nor less than twenty-five dollars, or imprisoned not exceeding one hundred nor less than thirty days, or both. And any person found guilty of manufacturing, offering for sale or selling an adulterated article of food or drug under the provisions of this act, shall be adjudged to pay in addition to the penalties hereinbefore provided for, all necessary costs and expenses incurred in inspecting and analyzing such adulterated articles of which said person may have been found guilty of manufacturing, selling or offering for sale. (7458-11; 81 v. 68.)

DAIRY PRODUCTS.

SEC. 76. [Regulating the sale of milk.] Whoever, by himself or by his servant, or agent, or as the servant or agent of any other person, sells, exchanges or delivers, or has in his custody or possession with intent to sell or exchange, or exposes or offers for sale or exchange, adulterated milk, or milk to which water or any foreign substance has been added, or milk from diseased or sick cows, shall, for a first offense, be punished by a fine of not less than fifty nor more than two hundred dollars; for a second offense, by fine of not less than one hundred dollars nor more than three hundred dollars, or by imprisonment in the work-house for not less than thirty nor more than sixty days; and for a subsequent offense, by fine of fifty dollars, and by imprisonment in the work-house of not less than sixty nor more than ninety days. (7458-12; 86 v. 229.)

SEC. 77. [Pure milk.] Whoever, by himself or by his servant or agent, or as the servant or agent of any other person, sells, exchanges or delivers, or has in his custody or possession, with intent to sell or exchange, or exposes or offers for sale as pure milk, any milk from which the cream or part thereof has been removed, shall be punished by the penalties provided in the preceding section. (7458-13; 86 v. 229.)

SEC. 78. [Skimmed milk.] No dealer in milk, and no servant or agent of such a dealer, shall sell, exchange, or deliver, or have in his cus-

tody or possession, with intent to sell, exchange or deliver, milk from which the cream or part thereof has been removed, unless in a conspicuous place, above the center, upon the outside of every vessel, can or package, from which or in which such milk is sold, the words "skimmed milk" are distinctly marked in uncondensed gothic letters not less than one inch in length. Whoever violates the provisions of this section shall be punished by the penalties provided in section 7458-12. (7458-14; 86 v. 229.)

SEC. 79. [Adulterated milk defined.] In all prosecutions under this chapter, if the milk is shown upon analysis, to contain more than eighty-seven per cent. of watery fluid, or to contain less than twelve and one-half per cent. solids, nor [not] less than one-fourth of which must be fat, it shall be deemed, for the purpose of this chapter, to be adulterated, and not of good standard quality, except during the months of May and June, when milk containing less than twelve per cent. of milk solids shall be deemed to be not of good standard quality. (1891, January 30; 88 v. 12.)

SEC. 80. [Restrictions on sale of artificial dairy products.] No person shall sell, expose or offer for sale or exchange, any substance purporting, appearing, or represented to be butter or cheese, or having the semblance of either butter or cheese, which substance is not made wholly from pure milk, or cream, salt and harmless coloring matter, unless it is done under its true name, and each vessel, package, roll or parcel of such substance has distinctly and durably painted, stamped, stenciled or marked thereon the true name of such substance in ordinary bold faced capital letters, not less than five-line pica in size, and also the name of each article or ingredient used or entering into the composition of such substance, in ordinary bold faced letters, not [less] than pica in size, or sell or dispose of in any manner to another any such substance without delivering with each amount sold or disposed of, a label on which is plainly or legibly printed in ordinary bold faced capital letters, not less than five-line pica in size, the true name of such substance, and also the name of such articles used and entering into the composition of such substance in ordinary bold faced letters, not less than pica in size, if the same be not made wholly from pure milk, or cream, salt and harmless coloring matter; and the words "butter," "creamery," or "dairy," or any word or combination of words embracing the same, shall not be placed on any vessel, package, roll or parcel containing any imitation dairy product or substance not made wholly from pure milk, or cream, salt, and harmless coloring matter. (7090-1; 84 v. 182.)

SEC. 81. [Restrictions on manufacture of] No person or persons shall manufacture out of any oleaginous substance or substances, or any compound of the same other than that produced from unadulterated milk or cream, salt and harmless coloring matter, any article designed to be sold as butter or cheese made from pure milk or cream, salt and harmless coloring matter. Nothing in this section shall prevent the use of pure skimmed milk in the manufacture of cheese. (7090-2; 83 v. 178.)

SEC. 82. [Further restrictions on manufacture, sale of, etc.] No person or persons shall manufacture, mix, compound with or add to natural or pure milk, cream, butter or cheese, any animal fats, animal, mineral or vegetable oils, nor shall any person or persons manufacture any oleaginous or other substance not produced from pure milk or cream, salt and harmless coloring matter, or have the same in his possession, or offer or expose the same for sale or exchange with intent to sell or in any manner dispose of the same as and for butter and cheese made from unadulterated milk or

cream, salt and harmless coloring matter, nor shall any substance or compound so made be sold or disposed of to any one as and for butter or cheese made from pure milk or cream, salt and harmless coloring matter. (7090-3; 83 v. 179.)

SEC. 83. [False brands and labels.] No person or persons shall sell, exchange, expose or offer for sale or exchange, dispose of or have in his possession any substance or article made in imitation or resemblance of, or as a substitute for any dairy product which is falsely branded, stenciled, labeled or marked as to the place where made, the name or cream value thereof, its composition or ingredients, or in any other respect. (7090-4; 83 v. 179.)

SEC. 84. [Brands, continued; skimmed milk cheese.] [No person or persons shall sell, exchange, expose or offer for sale or exchange, dispose of or have in his possession any dairy products which are falsely branded, stenciled, labeled or marked as to the place where made, date of manufacture, the name or cream value thereof, composition or ingredients, or in any other respect, and cheese wholly made from skimmed milk shall have branded upon the box or can "made from skimmed milk." (7090-5; 83 v. 179.)

SEC. 85. [Card to be displayed by dealers in artificial dairy products; sale of less than original package.] Every person in this state who shall deal in, keep for sale, expose or offer for sale or exchange, any substance other than butter or cheese made wholly from pure milk or cream, salt and harmless coloring matter, which appears to be, resembles or is made in imitation of, or as a substitute for butter or cheese, shall keep a card not less in size than ten by fourteen inches, in a conspicuous and visible place where the same may be easily seen and read in the store, room, stand, booth, wagon or place where such substance is, on which card shall be printed, on a white ground, in bold, black, Roman letters, not less in size than twelve-line pica, the words, "oleomargarine" or "imitation cheese," (as the case may be), "sold here," and said card shall not contain any other words than the ones above prescribed; and no person shall sell any oleomargarine, suine, imitation cheese, or other imitation dairy product, at retail or in any quantity less than the original package, tub or firkin, unless he shall first inform the purchaser that the substance is not butter or cheese, but an imitation of the same. (7090-6; 85 v. 74.)

SEC. 86. [Card to be displayed by keepers of hotels, restaurants, etc.] Every proprietor, keeper, or manager, or person in charge of any hotel, boarding house, restaurant, eating house, lunch counter, or lunch room, who therein sells, uses, or disposes of any substance which appears to be, resembles, or is made in, or as an imitation of, or is made as a substitute for butter or cheese, under whatsoever name, and which substance is not wholly made from pure milk or cream, salt, and harmless coloring matter, shall display and keep a card in a conspicuous place, where the same may be easily seen and read in the dining, eating, restaurant, and lunch room, and place where such substance is sold, used, or disposed of, which card shall be white and in size not less than ten by fourteen inches, upon which shall be printed in plain, bold, black Roman letters, not less in size than twelve-line pica, the words "oleomargarine sold and used here," or "imitation cheese sold and used here," (as the case may be), and said card shall not contain any other words than the ones above described, and such proprietor, keeper, manager, or person in charge shall not sell, furnish, or dispose of such substance as and for "butter and

cheese," made from pure milk or cream, salt, and harmless coloring matter, when butter or cheese is asked for. (7090-7; 85 v. 75.)

SEC. 87. [Fraudulent shipments.] No person or persons shall pack, box, inclose, ship or consign any substance, as butter or cheese made from pure milk or cream, salt and harmless coloring matter, in such a manner as to conceal an inferior article by placing a finer grade of butter or cheese upon the surface of the same. (7090-8; 83 v. 180.)

SEC. 88. [Sale of diluted milk; false accounts.] No person or persons shall sell to any person, or deliver or carry or cause to be carried to any cheese or butter factory to be manufactured, any milk diluted with water or in any way adulterated, or from which any cream has been taken, or milk commonly known as "skimmed milk," or milk from which [the] part known as "strippings" has been withheld with the intent to defraud, or keeps or renders any false account of the quantity or weight of milk furnished at or to any factory for manufacture or sold to any manufacturer. (7090-9; 83 v. 180.)

SEC. 89. [Impure and skimmed milk.] No person or persons shall sell, exchange or offer for sale or exchange, any unclean, impure, unhealthy, unwholesome milk, or sell, exchange, or offer for sale or exchange as "pure milk," milk diluted with water or milk known as skimmed milk. (7090-10; 83 v. 180.)

SEC. 90. [Milk falsely labeled, etc.] No person or persons shall sell, exchange, expose, or offer for sale or exchange, have in his possession or dispose of in any manner, any milk which is falsely branded, labeled, marked or represented as to grade, quantity or place where produced or procured. (7090-11; 83 v. 180.)

SEC. 91. [Cows unhealthily fed, etc.] No person shall keep cows for the production of milk for any purpose, in a cramped or unhealthy condition, or feed them on unhealthy food, or upon food that produces impure, unhealthy or unwholesome milk. (7090-12; 83 v. 180.)

SEC. 92. [Condensed milk.] No person shall manufacture, sell, exchange, expose or offer for sale or exchange, any condensed milk, unless the package, can or vessel containing the same shall be distinctly labeled, stamped or marked with its true name, brand, by whom and under what name made, and no condensed milk shall be made, exchanged, exposed or offered for sale or exchange, unless the same be made from pure, clean, healthy, fresh unadulterated and wholesome milk, from which the cream has not been removed, or unless the proportion of milk solids contained in the condensed milk shall be in amount the equivalent of twelve per centum of milk solids in crude milk, and of such solids, twenty-five per centum shall be fat. (7090-13; 83 v. 180.)

SEC. 93. [State institutions.] No butter or cheese not made wholly from pure milk or cream, salt and harmless coloring matter, shall be used in any of the charitable or penal institutions of the state. (7090-14; 83 v. 180.)

SEC. 94. [Penalties.] Any person or persons violating any of the provisions or sections of this act shall, upon conviction thereof be fined not less than fifty or more than two hundred dollars for the first offense, or for each subsequent offense not less than one hundred dollars or more

than five hundred dollars, and be imprisoned not less than ten days or more than ninety days, or both. (7090-15; 83 v. 180.)

SEC. 95. [Informers.] One-half of all fines collected under any of the provisions of this act, shall be paid over to the person or persons furnishing information under which conviction is procured. (7090-16; 83 v. 180.)

SEC. 96. [Butter and cheese: manufacture of articles in imitation of natural, prohibited.] No person, by himself or his agent, or his employe, shall render or manufacture for sale out of any animal or vegetable oils, not produced from unadulterated milk or cream from the same, any article in imitation or semblance of natural butter or cheese produced from pure unadulterated milk or cream from the same, nor compound with, or add to milk, cream or butter any acids or other deleterious substance, or animal fats or animal or vegetable oils not produced from milk or cream, so as to produce any article or substance, or any human food, in imitation or semblance of natural butter or cheese, nor shall sell, keep for sale or offer for sale any article, substance or compound made, manufactured or produced in violation of the provisions of this section, whether such article, substance or compound shall be made or produced in this state or elsewhere. (1890, March 7: 87 v. 51.)

SEC. 97. ["Natural butter and cheese," etc., defined; oleomargarine.] For the purpose of this act the terms "natural butter and cheese," "natural butter or cheese produced from pure unadulterated milk or cream from the same, butter and cheese made from unadulterated milk or cream, butter or cheese the product of the dairy," and butter or cheese, shall be understood to mean the products usually known by the terms butter and cheese, and which butter is manufactured exclusively from pure milk or cream or both, with salt and with or without any harmless coloring matter, and which cheese is manufactured exclusively from pure milk or cream, or both, with salt and rennet and with or without any harmless coloring matter or sage. It is further provided that nothing in this act shall be construed to prohibit the manufacture or sale of oleomargarine, in a separate and distinct form, and in such manner as will advise the consumer of its real character, free from any coloring matter or other ingredient causing it to look like or to appear to be butter, as above defined. (1890, March 7: 87 v. 51.)

SEC. 98. [Penalty.] Whoever violates the provisions of this act shall be guilty of a misdemeanor, and be punished by a fine of not less than one hundred dollars, nor more than five hundred, or not less than six months' nor more than one year's imprisonment for the first offense, and by imprisonment for one year for each subsequent offense. (1890, March 7: 87 v. 52.)

SEC. 99. [Selling unwholesome provisions.] Whoever sells any kind of diseased, corrupted, adulterated, or unwholesome provisions, whether for meat or drink, without making the condition of the same known to the buyer, and whoever kills for the purpose of sale, any calf less than four weeks' old, or sells, or has in possession within intent to sell, the meat of any calf which he knows to have been killed when less than four weeks' old, shall be fined not more than fifty dollars, or imprisoned twenty days, or both. (6928; 29 v. 144.)

CANDY.

SEC. 100. [Manufacture and sale of adulterated candy.] No person shall manufacture for sale, or sell or offer to sell any candy adulterated by the admixture of terra alba, berytes, talc or other mineral substance, or poisonous colors or flavors, or other ingredients deleterious or detrimental to health. (7458-4; 83 v. 119.)

SEC. 101. [Samples.] Every person manufacturing any candy, or offering or exposing the same for sale, shall furnish to any person interested or demanding the same, who shall apply to him for that purpose, and shall tender him the value of the same, a sample sufficient for the analysis thereof. (7458-5; 83 v. 119.)

SEC. 102. [Penalties.] Whoever refuses to comply, upon demand, with the requirements of section 2 [7458-4] and whoever violates any of the provisions of this act, shall be guilty of a misdemeanor, and upon conviction, shall be fined not exceeding one hundred dollars nor less than twenty-five dollars, or imprisoned not exceeding one hundred nor less than thirty days, or both; and he shall be adjudged to pay in addition all necessary costs and expenses incurred in the inspecting and analyzing such adulterated candy, and the same shall be forfeited and destroyed under the direction of the court (7458-6; 83 v. 119.)

VINEGAR.

SEC. 103. [Manufacturing and sale of adulterated vinegar forbidden.] No person shall manufacture for sale, or knowingly offer or expose for sale as cider, apple, or orchard vinegar, any vinegar not the legitimate product of pure apple juice, known as apple cider; or vinegar not made exclusively of said apple cider; or vinegar into which foreign substances, drugs or acids have been introduced, as may appear by proper test. (7458-16; 85 v. 259.)

SEC. 104. [Injurious ingredients.] No person shall manufacture for sale, or knowingly offer for sale, or have in his possession with intent to sell, any vinegar found upon proper tests to contain any preparation of lead, copper sulphuric acid, or other ingredients injurious to health. (7458-17; 85 v. 259.)

SEC. 105. [Brands on casks.] Every person making or manufacturing cider vinegar, who is not a domestic manufacturer of cider or cider vinegar, shall brand on each head of the cask, barrel or keg containing such vinegar, the name and residence of the manufacturer, the date when same was manufactured, and the words "Cider Vinegar." And no vinegar shall be branded "Fruit Vinegar," unless the same be made wholly from apples, grapes, or other fruit. (7458-19; 85 v. 259.)

SEC. 106. [Penalties.] Whoever violates any of the provisions of this act shall, upon conviction, be fined not less than fifty dollars, nor more than one hundred dollars, or imprisoned not less than thirty days, nor more than one hundred days, or both; and shall be adjudged to pay in addition all necessary costs and expenses incurred in inspecting and analyzing such vinegar. And all vinegar not in accordance with this act shall be subject to forfeiture and spoliation. (7458-20; 85 v. 259.)

DIVISION IV.

Relating to Wines and Liquors.

SEC. 107. [Adulterated wine: defined; penalty for manufacturing or selling.] All liquors denominated as wine containing alcohol, "except such as shall be produced by the natural fermentation of pure, undried grape-juice," or compounded with distilled spirits, or by both methods, whether denominated as wine, or by any other name whatsoever, in the nature of articles for use as beverages, except as allowed in section four of this act, or for compounding with other liquors for such use, and all compounds of the same with pure wine, and all preserved fruit-juices compounded with substances not produced from undried fruit, in character of, or intended for use as beverages, and all wines, (including all grades and kinds) which contain, or in the production or manufacture of which, any glucose, or uncrystallized grape or starch sugar, or cider, or pomace of grapes out of which the juice has been pressed or extracted, known as grape cheese, has been used, and all wines, imitation of wines or other beverages produced from fruit into which carbonic acid gas has been artificially injected, or which shall contain any alum, baryta, salts, caustic lime, carbonate of soda, carbonate of potash, carbonic acid, salts of lead, salicylic acid or any other antiseptic, coloring matter (other than produced from undried fruit, or pure sugar), essence of either, or any foreign substance whatever, which is injurious to health, shall be denominated as adulterated wine, and any person or persons who shall manufacture or cause the same to be done, with intent to sell or shall sell or offer to sell, any of such wine or beverage, shall be guilty of a misdemeanor, and shall be punished by a fine of not less than two hundred dollars, or more than one thousand dollars, or be imprisoned in the county jail for a term of not less than thirty days or more than six months, or by both such fine and imprisonment, in the discretion of the court, and shall be liable to a penalty of one dollar for each gallon thereof sold, offered for sale, or manufactured with intent to sell, and such wine or beverage shall be deemed a public nuisance and forfeited to the state, and shall be summarily seized and destroyed by any health officer, marshal, constable or sheriff, within whose jurisdiction the same shall be found, and the reasonable expense of such seizure and destruction not exceeding the amount paid for similar services, shall be a county charge, and paid out of the county treasury in the same manner as costs in criminal cases, where the state fails to convict, are now allowed and paid out of such treasury. (1891. March 26: 7458-21; 88 v. 231.)

SEC. 108. [Pure wine: defined; must be stamped as such.] For the purpose of this act the words "pure wine" shall be understood to mean fermented juice of the undried grapes, without the addition thereto of water, sugar, or any foreign substance whatever; and all such wines shall

be known as "pure wine" and shall be stamped, branded, labeled designated and sold as "pure wine," and the name and kind of wine, and that of the locality where such wine is made, and of the manufacturer, may also be added; and it shall be unlawful to affix any stamp, brand or label containing the words "pure wine" (either alone or with other words) on any vessel, package, bottle or other receptacle containing any substance other than pure wine as in this section defined, or to prepare or use on any vessel, package, bottle or other receptacle containing any liquid, any imitation or counterfeit of such stamp, label or brand, or any stamp, label or brand of such form and appearance as to be calculated to mislead or deceive any person, or cause to be supposed that the contents thereof be pure wine, or to use any vessel, package, bottle or other receptacle, having such stamp, brand or label affixed thereon, except for pure wine, as in this section defined; and if the name of the manufacturer is added, then only of such manufacturer's make, providing the same is pure wine. And any person selling such wine, shall in the invoice thereof plainly state and designate the same as "pure wine." (1891, March 26: 7458-22; 88 v. 231.)

SEC. 109. [Wine: defined; must be stamped as such.] For the further purpose of this act the word "wine" shall be understood to mean the fermented juice of undried grapes; provided, however, that the addition of pure white or crystalized sugar to perfect the wine, or the using of the necessary things to clarify and refine the wine which are not injurious to health, shall not be construed as adulterations, but such wines shall contain at least seventy-five per cent. of pure grape-juice, and shall not contain any artificial flavoring whatever; and all such "wine" shall be known as "wine," and shall be stamped, branded, labeled and sold as "wine," in the same manner as is provided in section two [7458-22] of this act in case of pure wine, except the words in this case shall be "wine" without the prefix "pure;" and all the provisions of said section two, as far as applicable, shall govern the manufacture and sale of "wine" as in this section defined. And any person selling such wine shall in the invoice thereof plainly state and designate the same as "wine" without using the prefix "pure." (1891, March 26: 7458-23; 88 v. 232.)

SEC. 110. [Compounded wine: defined; must be branded as such.] For the further purpose of this act, the word "compounded wine" shall be understood to mean any wine which contains less than seventy-five per cent. of pure undried grape-juice, and is otherwise pure, and all wines containing alcohol or any other distilled spirits not produced by the natural fermentation of pure undried grapes, such wine shall be known as compounded wine, and shall be branded, marked, labeled and sold as compounded wine, and the name of such wine may be added, or such wine shall be branded, labeled and marked by using the word "compounded" next preceding the name of such wine, such as "compounded sweet catawba," or "compounded port wine," or the like (and an addition of pure distilled spirits not to exceed eight per cent. of its volume shall not be taken to be an adulteration of such wine); and upon each and every package, barrel or other receptacle of such wine, which shall contain more than three gallons, there shall be stamped upon both ends of such package, barrel or other receptacle, in black printed letters at least one inch high and of proper proportion, the words "compounded wine," or the name of such wine, preceded by the word "compounded" as in this section provided, and upon all packages or other receptacles which shall contain more than one quart and up to three gallons, there shall be stamped upon each of said packages or receptacles in plain, printed black letters, at least

one-half inch high, and of proper proportion, the words "compounded wine," or the name of such wine, preceded by the word "compounded" as in this section provided, and upon all packages, bottles or other receptacle of one quart or less, there shall be placed a label securely pasted thereon, on which label the words "compounded wine," or the name of the wine, preceded by the word "compounded," shall be plainly printed in black letters at least one-fourth of an inch high and of proper proportion. Should any number of such packages or other receptacle be inclosed in a larger package, as a box, barrel, case or basket, such outside package shall also receive the stamp, "compounded wine" or the name of such wine, preceded by the word "compounded," the letters to be the size according to the amount of such wine contained in such outside packages. And any person selling wine of the kind this section defined, shall in the invoice thereof plainly state and designate such wine as "compound wine." (1891, March 26: 7458-24; 88 v. 232.)

SEC. 111. [Penalty for violating this act; duty of prosecuting attorney.] Any person or persons who shall sell or offer for sale, or manufacture or cause the same to be done, with intent to sell any wine stamped or labeled, or branded, or designated in any manner as "pure wine," either by including the word "pure" with "wine" alone or in connection with other words, which is not "pure wine" as is in section two [7458-22] of this act defined, or any wine stamped, or labeled or branded, or in any manner designated as "wine," but which is not wine as in section three [7458-23] of this act defined, or shall violate any provision of said sections two and three of this act, or shall sell or offer for sale, or manufacture, or cause the same to be done, with intent to sell any wine of the kind and character as described in the fourth section [7458-24] of this act, which shall not be stamped, marked, or labeled after the manner and mode therein prescribed, or which is falsely stamped, or marked, or labeled, such person or persons shall be guilty of a misdemeanor, and shall be punished by a fine of not less than one hundred dollars or more than one thousand dollars for each and every offense, or by imprisonment in the county jail not less than thirty days, or more than six months, or both fine and imprisonment, in the discretion of the court, and in addition thereto shall be liable to a penalty of one-half dollar for each gallon thereof sold, offered for sale, or manufactured with intent to sell or offer for sale. All penalties imposed by this act, may be recovered with costs of action by any person in his own name, before any justice of the peace in the county where the offense was committed, where the amount does not exceed the jurisdiction of such justice; and such penalties may be recovered in the like manner in any court of record in the state, but on the recovery by the plaintiff in such case for a sum less than fifty dollars, the plaintiff shall only be entitled to costs to amount equal to the amount of such recovery. It shall be the duty of the prosecuting attorney of the respective counties of this state, and they are hereby required to prosecute or commence action in the name of the state of Ohio, for the recovery of the penalties allowed herein, upon receiving proper information thereof, and in actions brought by such prosecuting attorney, one-half of the penalty recovered shall belong to and be paid over to the person or persons giving the information upon which the action is brought, and the other one-half shall be paid to the treasurer of the county in which said action is brought, within thirty days from the time of its collection, and such money shall be placed to the credit of the poor fund of the town, city or township in which the cause of action arose, after paying therefrom a

reasonable attorney fee to the prosecuting attorney prosecuting such suit, to be fixed and allowed by the court trying such cause. All judgments recovered in pursuance of the provisions of this act, with interest thereon, may be collected and enforced by the same means and in the same manner as judgments in other cases. Two or more penalties may be included in the same action. (7458-25; 86 v. 96.)

SEC. 112. [**Exceptions.**] The provisions of this act shall not apply to medicated wines, such as are put up and sold for medicinal purposes only; nor to currant wine or other wines made from fruits, other than grapes, which are plainly labeled, or branded, or designated and sold, or offered for sale under names including the word wine, but also expressing distinctly the fruit from which they are made, as "gooseberry wine," "elderberry wine," or the like. (7458-26; 86 v. 96.)

SEC. 113. [**Adulterating liquors.**] Whoever adulterates, except for medicinal or mechanical purposes any spirituous or alcoholic liquors, by mixing the same with any substance, or sells or offers to sell, any such liquor, knowing the same to be thus adulterated, or imports into this state and sells or offers to sell, any such liquor, knowing the same to be thus adulterated, and not inspected as required by law, shall be fined not more than five hundred nor less than one hundred dollars, and imprisoned not more than thirty nor less than ten days. (6950; 52 v. 108)

SEC. 114. [**Adulterating domestic wines.**] Whoever adulterates any wine made, or juice expressed, from grapes grown within the state of Ohio, by mixing therewith any drugs, chemical-, cider, whisky, or other liquor; and whoever sells, or offers to sell, any such adulterated wine or grape juice, knowing the same to be adulterated, shall be fined in any sum not more than three hundred nor less than fifty dollars. (7081; 62 v. 179.)

SEC. 115 [**Adulterating or selling adulterated liquors, how punished.**] Whoever adulterates, for the purpose of sale, any spirituous, alcoholic or malt liquors used or intended for drink, or medical or mechanical purposes, with cocculus-indicus, vitriol, grains of paradise, opium, alum, capsicum, copperas, laurel water, logwood, Brazil-wood, cochineal, sugar of lead, aloes, glucose, tannic acid, or any other substance which is poisonous or injurious to health, or with any substance not a necessary ingredient in the manufacture thereof; and whoever sells or offers or keeps for sale any such liquors so adulterated, shall be fined in any sum not less than twenty nor more than one hundred dollars, or be imprisoned not less than twenty nor more than sixty days, or both, at the discretion of the court. And any person guilty of violating any of the provisions of this section, shall be adjudged to pay, in addition to the penalties hereinbefore provided for, all necessary costs and expenses incurred in inspecting and analyzing any such adulterated liquors of which said party may have been guilty of adulterating, or selling, or keeping for sale, or offering for sale. (7082; 79 v. 52)

SEC. 116. [**Manufacturing or selling poisoned liquors.**] Whoever uses any active poison in the manufacture or preparation of any intoxicating liquor, or sells in any quantity any intoxicating liquor so manufactured or prepared, shall be imprisoned in the penitentiary not more than five years nor less than one year. (7083; 54 v. 183.)

SEC. 117. [**Using vessel with private stamp affixed.**] Whoever puts into any barrel, cask, or other vessel, having the private stamp, brand, wrapper, label, or trade-mark usually affixed by any maker of wine from grapes grown within the state of Ohio, adulterated liquors, for the

purpose of deceiving any person by the sale thereof, shall be fined not more than one hundred dollars, or imprisoned not more than twelve nor less than three months, or both. (7073; 62 v. 179.)

SEC. 118. [Putting adulterated liquors in branded packages.] Whoever puts into any barrel, cask or other vessel, branded or marked pure by any inspector in this state, adulterated liquors, or knowingly sells or offers for sale such liquors in packages so branded, shall be imprisoned in the penitentiary not more than twelve months. (7074; 52 v. 108)

DIVISION V.

Relating to Pharmacy.

DRUGGIST AND STATE BOARD OF PHARMACY.

SEC. 119. [Who may retail drugs; proviso.] It shall be unlawful for any person not a registered pharmacist to open or conduct any pharmacy or retail drug or chemical store, as proprietor thereof, unless he shall have in his employ and place in charge of such pharmacy, or store, a registered pharmacist within the meaning of this chapter, who shall have the supervision and management of that part of the business requiring pharmaceutical skill and knowledge; or to engage in the occupation of compounding or dispensing medicines on prescriptions of physicians, or of selling at retail for medicinal purposes, any drugs, chemicals, poisons, or pharmaceutical preparations within this state, until he has complied with the provisions of this chapter; provided, nothing in this section shall apply to, or in any manner interfere with the business of any physician, or prevent him from supplying to his patients such articles as may seem to him proper, or with the making or vending of patent or proprietary medicines by any retail dealer, or with the selling by any country store of copperas, borax, blue vitriol, saltpeter, sulphur, brimstone, licorice, sage, juniper berries, senna leaves, castor oil, sweet oil, spirits of turpentine, glycerine, glauher salt, epsom salt, cream of tartar, bi-carbonate of sodium, and of paregoric, essence of peppermint, essence of cinnamon, essence of ginger, hive syrup, syrup of ipecac, tincture of arnica, syrup of tolu, syrup of squills, spirits of camphor, number six, sweet spirits of nitre, compound cathartic pills, quinine pills, and other similar preparations when compounded by a registered pharmacist and put up in bottles and boxes bearing the label of such pharmacist or wholesale druggist, with the name of the article and directions for its use on each bottle or box, or with the exclusively wholesale business of any dealer. (4405; 81 v. 61.)

SEC. 120 [How pharmaceutical examining board appointed; vacancy in board, how filled.] The Ohio State Pharmaceutical Association shall, immediately upon the passage of this act, submit to the governor the names of ten persons, residents of this state, who have had at least ten years' experience as pharmacists and druggists, and from the names so submitted to him or others, the governor shall, with the approval of the senate, select and appoint five persons, who shall constitute a board, to be styled the Ohio Board of Pharmacy; and any member of the board may be removed by the governor for good cause shown him; one member of said board shall be appointed, and hold his office for one year, one for two years, one for three years, one for four years, and one for five years, and until his successor shall be appointed and qualified; and at its regular annual meeting in each and every year thereafter, the said Ohio State Pharmaceutical Association shall select and submit to the governor the names of five persons, with the qualifications hereinbefore mentioned, and the governor shall, with the approval of the Senate, select and appoint from the names so submitted or others, one member of said board, who shall hold his office for five years, and until his successor shall be appointed and qualified. Any vacancy that may occur in said board shall be filled for the unexpired term by the governor, with the approval of the senate. Each member of said board shall, within ten days after his appointment, take and subscribe an oath or affirmation, before a competent officer, to faithfully and impartially perform the duties of his office. (4406; 81 v. 62.)

SEC. 121. [Sessions of board, when and where held; duties of board; register to be kept; who may be registered without examination; salary of secretary; etc.] The Ohio Board of Pharmacy shall hold three regular meetings in each year; one at Cincinnati on the second Monday of January, one at Columbus on the second Monday of May, and one at Cleveland on the second Monday of October, and such additional meetings, at such times and places, as may be determined upon by said board, at each of which meetings it shall transact such business as is required of it by law; said board shall make such rules, by-laws and regulations as may be necessary for the proper discharge of its duties, and shall make a report of its proceedings, including an itemized account of all moneys received and expended by said board, pursuant to this chapter, and a list of the names of all pharmacists duly registered under this act, to the secretary of state on the 15th day of November, 1884, and annually thereafter, and to the Ohio State Pharmaceutical Association. Said board shall keep a book of registration open at some place in Columbus, of which due notice shall be given in three or more newspapers of general circulation in this state, in which the name and place of business of every person duly qualified under this chapter to conduct, or engage in the business mentioned and described in section 4405, shall be registered. Every person now conducting or engaged in such business in this state as proprietor or manager of the same, or who being of the age of eighteen years, has been employed or engaged for three years preceding the passage of this act as an assistant in any retail drug store in the United States, in the compounding or dispensing of medicines on the prescriptions of physicians, who shall furnish satisfactory evidence in writing and under oath of such facts, within three months after the publication of said notice, shall be registered as a pharmacist, or assistant pharmacist, as the case may be, without examination. Every person who shall hereafter desire to conduct, or engage in such business in this state, shall appear before said board, and be registered within ten days after receiving a certificate of competency and qualification from said board. The said board shall demand and receive for

such registration from each and every person registered as a pharmacist, a fee of not exceeding three dollars, and from each and every person registered as an assistant pharmacist, a fee not exceeding two dollars, to be applied to the payment of the expenses arising under the provisions of this chapter. Provided, however, that no such fee shall be demanded of any person who has heretofore been registered as the proprietor or manager of such business or as an assistant therein, under the provisions of any law heretofore in force in this state. Every registered pharmacist, or assistant pharmacist, who desires to continue the practice of his profession, shall, triennially thereafter, during the time he shall continue in such practice, on such date as said board may determine, pay to the secretary of said board a registration fee, to be fixed by said board, but which shall in no case exceed, if a pharmacist, one dollar, if assistant pharmacist, fifty cents, for which he shall receive a renewal of said registration. Every certificate of registration granted under this act shall be conspicuously exposed in the prescription department of the drug or chemical store to which it applies, or in which the assistant is engaged. The secretary of said board shall receive a salary which shall be fixed by said board; he shall also receive his traveling and other expenses incurred in the performance of his official duties. The other members of said board shall receive the sum of three dollars for each day actually engaged in the service thereof, and all legitimate and necessary expenses incurred in attending the meetings of said board. Said salary, per diem and expenses shall be paid after an itemized statement of the same has been rendered and approved by the board from the fees and penalties received by said board under the provisions of this act. All moneys received in excess of said per diem allowance, and other expenses above provided for, shall be held by the secretary as a special fund for meeting the expenses of said board; he giving such bond as said board shall from time to time direct. (4407; 81 v. 62.)

SEC. 122. [Duties of board with respect to examinations.] The Ohio Board of Pharmacy shall examine every person who desires to carry on or engage in the business of a retail apothecary, or of retailing any drugs, medicines, chemicals, poisons or pharmaceutical preparations, or of compounding and dispensing the prescriptions of physicians, as proprietor and manager, touching his competency and qualification for that purpose, and upon a majority of the board being satisfied with such competency and qualification, as pharmacist, which certificate shall entitle the person named therein to conduct and carry on the business aforesaid, as proprietor and manager thereof, upon complying with the requirements of section 4407; and such board shall also examine each person who desires to engage in such business as assistant pharmacist, touching his competency and qualification, and upon any such person passing a satisfactory examination, shall furnish a certificate setting forth that he is a qualified assistant in pharmacy, which certificate shall enable the person named therein to engage in said business as an assistant pharmacist upon his complying with the provisions of section 4407. (4408; 81 v. 63.)

SEC. 123. [To whom preceding provisions do not apply.] The provisions of [section] 4408 shall not apply to any person engaged in the retail drug and apothecary business, as proprietor or manager of the same, at the time of the passage of this act, or who, being at the age of eighteen years has been continuously employed or engaged for three years immediately preceding the passage of this act as assistant in any retail drug store in the United States, in the compounding or dispensing of medicines

on the prescriptions of physicians, who has complied with the provisions of section 4407. (4409; 81 v. 64.)

SEC. 124. [Who may not compound prescriptions.] No person, not a qualified assistant, shall be allowed by the proprietor or manager of any retail drug or chemical store, to compound or dispense the prescriptions of physicians, except as an aid under the supervision of a registered pharmacist, or his qualified assistant. (4410; 84 v. 220.)

SEC. 125. [Qualified assistants.] A qualified assistant, within the meaning of this chapter, shall be a clerk or assistant in a retail drug or chemical store, who shall furnish to the Ohio board of pharmacy such evidence of his employment as is required by section 4407; or a person holding the certificate of said board, as an assistant pharmacist, as provided in section 4408; but it shall be unlawful for such assistant pharmacist, or qualified assistant, to supervise or manage any pharmacy or retail drug or chemical store, or to engage in the occupation of compounding or dispensing medicines on prescriptions of physicians, or of selling at retail for medicinal purposes, any drugs, chemicals, poisons or pharmaceutical preparations, except when engaged or employed in a pharmacy, retail drug or chemical store which is in charge of, and is under the supervision and management of a registered pharmacist. (4411; 84 v. 220.)

SEC. 126. [Penalties; duty of Ohio board of pharmacy.] Any person owning a pharmacy or retail drug or chemical store, who, in violation of the provisions of section 4405 of this act, causes or permits the same to be conducted or managed by a person, not a registered pharmacist, shall be deemed guilty of a misdemeanor, and upon conviction thereof, shall be fined in any sum not less than twenty dollars, nor more than one hundred dollars, and each week that he shall cause or permit such pharmacy, retail drug or chemical store to be so conducted or managed, shall constitute a separate and distinct offense, and render him liable to a separate prosecution and punishment therefor; a person violating the provisions of section 4407, relating to registration, renewal of registration, or failing to conspicuously expose such certificate of registration, shall be deemed guilty of a misdemeanor, and upon conviction thereof, shall be fined in any sum not exceeding one hundred dollars for each week he continues to carry on or to be engaged in such business without such registration or such exposure of such certificate of registration, or renewal thereof. And for the violation of any of the provisions of section 4410, such proprietor or manager shall be deemed guilty of a misdemeanor, and upon conviction thereof, shall be fined in any sum not exceeding fifty dollars for each and every offense; and for violation of any of the provisions of [section 4411, such assistant pharmacist shall be deemed guilty of a misdemeanor, and upon conviction thereof, shall be fined in any sum not exceeding fifty dollars for each and every offense; all fines assessed for the violation of any of the provisions of this act shall be placed in the county treasury, for the use and benefit of the common school fund of the county in which such offense is committed; provided, that nothing in this act shall be so construed as to in any way affect the right to any person to bring a civil action against any person referred to in this act, for any act or acts for which a civil action may now be brought. It shall be the duty of the Ohio board of pharmacy, upon application therefor being made to said board, to cause the prosecution of any person or persons violating any of the provisions of this act. (4412; 84 v. 220.)

MORPHINE: POISONS.

SEC. 127. [Morphine: by whom and how to be sold.] It shall not be lawful for any person, other than a wholesale druggist or other dealer in drugs and medicine, to sell or offer for sale at wholesale, or for any person other than a registered pharmacist or a registered assistant pharmacist, to sell or offer for sale at retail, morphine or any of its salts, in this state, and it shall not be lawful for such persons to sell or offer for sale morphine or any of its salts in any bottle, vial, envelope or other package, unless the same shall be wrapped in a scarlet paper or envelope and all bottles or vials used for the above purpose shall contain not more than one drachm each, and shall have in addition to said scarlet wrapper, a scarlet label lettered in white letters, and the same must be upon both vial and wrapper when vials are used, plainly naming the contents of said bottle, and further, that no person shall have the right to change any preparation of morphine from its original package to any other receptacle whatever for the purpose of retailing or dispensing therefrom, but it must be retailed or dispensed only from the original package with scarlet wrapper and scarlet label as aforesaid. (8209-24; 83 v. 69.)

SEC. 128. [Penalty.] Any one violating the provisions of the above section, shall be guilty of a misdemeanor, and on conviction thereof shall be fined not less than ten nor more than fifty dollars, at the discretion of the court, for each and every violation of the preceding section. (8209-25; 83 v. 69.)

SEC. 129. [Poisons: must be labeled by druggists, etc.] Whenever any pharmacist, druggist or other dealer in poisons, chemicals, medicines and drugs, whether wholesale or retail, shall sell any drug or chemical, and indiscriminate or careless use of which would be destructive of human life, such dealer shall affix to each bottle or package of such drug, chemical or poison, a label printed in red ink, having on it the name of the article by which it is commonly known, the cautionary emblem of the skull and cross-bones, the words "caution" and "poison," and in addition thereto, at least two of the most readily obtainable effective antidotes to such poisonous article. (1890, April 21; 87 v. 235)

SEC. 130. [Penalty.] Whoever violates the provisions of section one [the above section] of this act shall, upon conviction thereof before any court having competent jurisdiction, be fined in any sum not exceeding one hundred (100) dollars, nor less than ten (10) dollars. (1890, April 21; 87 v. 235.)

SEC. 131. [Selling or giving away poisons.] Whoever sells, or gives away, any quantity of arsenic less than one pound, without first mixing therewith soot or indigo in the proportion of one ounce of soot or half an ounce of indigo to the pound of arsenic, or, except upon the prescription of a physician, sells, or gives away, any quantity of any article belonging to the class usually denominated poisons, to any minor, or sells, or gives away, any such article to any person, without having first marked the word "poison" upon the label or wrapper containing the same, and registered in a book to be by him kept for that purpose, the day and date upon which it is sold or given away, the quantity thereof, the name, age, sex, and color of the person obtaining the same the purpose for which it is required, and the name and place of abode of the person for whom the same is intended, shall be fined not more than two hundred nor less than twenty dollars. (6957; 50 v. 167.)

SEC. 132. [Depositing poison in thoroughfares.] Whoever leaves or deposits any poison, or any substance containing poison, in any common, street, alley, lane, or thoroughfare of any kind, or any yard or inclosure other than the yard or inclosure occupied by such person, shall be fined not more than fifty nor less than five dollars, or imprisoned not more than thirty nor less than five days, or both, and shall be liable to the person injured for all damages sustained thereby. (6958; 74 v. 13)

SEC. 133. [Sale and use of opium; keeping a place therefor; or resorting to such place, a misdemeanor; penalty.] Every person who opens or maintains, to be resorted to by other persons, any place where opium, or any of its preparations is sold or given away, to be smoked at such place, and any person who at such place sells or gives away any opium or its said preparations, to be there smoked or otherwise used, and any person who visits or resorts to any such place for the purpose of smoking opium, or its said preparations, shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine not exceeding five hundred dollars (\$500.), or by imprisonment in the county jail not exceeding three months or by both such fine and imprisonment. (7017-1; 82 v. 49.)

DIVISION VI.

RELATING TO THE

Practice of Medicine and Dentistry.

PHYSICIAN.

SEC. 134. [Who may practice medicine; graduates from foreign states.] No person who is not a graduate of a reputable school of medicine, either in the United States or a foreign country, or who can not produce a certificate of qualification from a state or county medical society, and is not a person of good moral character, shall practice, or attempt to practice medicine in any of its departments, or prescribe medicine for reward or compensation, for any person within this state; except that when a person has been continuously engaged in the practice of medicine for a period of ten years or more, he shall be considered to have complied with the provisions of this chapter; and when a person has been in continuous practice of medicine for five years or more, he shall be allowed two years in which to comply therewith. Provided, however, that any person who shall have graduated at any school of medicine in any state or foreign country in which any condition or restriction is imposed by the

laws thereof upon the practice of medicine by the graduates of medical schools in Ohio, shall be subject to the same restrictions or conditions in the practice of medicine in this state as are imposed upon such graduates of medical schools of Ohio by the laws of such state or foreign country; and a person violating this section shall not be entitled to any compensation for services rendered. (4403; 82 v. 218.)

SEC. 135. [Penalty prescribed for selling and using fraudulent medical diplomas.] Whoever shall make, issue, or publish, for purpose of sale, barter, or gift, any certificate, diploma, or other writing, or document falsely representing the holder or receiver thereof to be a graduate of any medical school, or college, or of any educational institution of medicine whatsoever, and entitled to the powers, privileges or degrees thereby pretended to be conferred; or whoever shall sell, or otherwise dispose of, or offer to do so, any such diploma, certificate, writing or document containing the false representation aforesaid; or whoever shall use his name, or permit the same to be used, as a subscriber for any purpose or in any capacity to such false and fictitious diploma, certificate, writing or document, aforesaid, or whoever shall engage in the practice of medicine and surgery under and by virtue of such fraudulent diploma, certificate, writing or document aforesaid, upon conviction thereof, shall be subject to the penalty prescribed in section 4403*b*. (4403*a*; 78 v. 27.)

SEC. 136. [Penalty for issuing such diploma for sale.] Whoever shall make, issue, or publish, or cause to be made, issued, or published, for the purpose of sale, barter, or gift, any diploma, certificate, or writing representing the holder thereof to be a graduate of any medical school, or college, or of any educational institutional of medicine whatsoever, unless such holder shall have, in fact, attended a complete course of instruction in such school, college, or institution for medical teaching, which course shall be equal to the average course of instruction in other schools, colleges or institutions where the various branches of medicine are taught as a science, in good standing in the state of Ohio, upon conviction thereof shall be fined in any sum not exceeding one thousand dollars, nor less than one hundred dollars, or imprisoned in the penitentiary not more than three years, nor less than one year, or both, at the discretion of the court. (4403*b*; 78 v. 28.)

(When a statute of the State imposed a penalty upon any person who should practice physic, unless he had a prescribed qualification, it was held that a patent from the United States, securing the exclusive right to manufacture and use a certain medicine, did not authorize the administration of such medicine by the patentee, in the character of a practicing physician, unless he had the qualification prescribed by the statute: *Jordan v. Overseers of Dayton*, 4 O., 294; and while the act of February 26, 1824 (3 Chase 1966), which deprived persons who were not members of a medical society of the aid of the law to collect for their services as physicians, was in force, services rendered in that capacity by persons not such members could not be recovered for, and the repeal of that act did not give a right of action therefor, a void contract never being revived: *Nichols v. Poulson*, 6 O., 305.)

An empiric, under the act of May 5, 1868 (65 v. 146), is liable to a civil action for malpractice, notwithstanding it is made a penal offense for such person to practice medicine in any of its departments: *Musser v. Chase*, 29 O. S. 577.

SEC. 137. [Practicing medicine or surgery without qualification.] Whoever prescribes, or practices, or attempts to practice medicine in any of its departments, or performs, or attempts to perform a surgical opera-

tion, without having attended two full courses of instruction, and graduated at a school of medicine, either in this or a foreign country, or who can not produce a certificate of qualification from a state or county medical society, except that when a person has been continuously engaged in the practice of medicine for a period of ten years or more, he shall be considered to have complied with the provisions of this chapter, and when a person has been in continuous practice of medicine for five years or more, he shall be allowed two years in which to comply therewith, shall, for the first offense, be fined not more than one hundred nor less than fifty dollars, and for any subsequent offense be imprisoned for the term of thirty days. (6992; 78 v. 183.)

Under the act of May 5, 1868 (65 v. 146), to protect the citizens of Ohio from empiricism, it is not unlawful for a person of good moral character to practice medicine and surgery, for reward or compensation, who has been engaged in the continuous practice of medicine for ten years or more: *Wert v. Clutter*, 37 O. S. 347. *White, J. and Okey, C. J.*, dissented.

Such ten years of continuous practice may embrace time since, as well as before, the taking effect of said act: *Ib.*

It is immaterial whether the services rendered during such period of practice were gratuitous or for compensation: *Ib.*

SEC. 138. [Administering medicine when intoxicated.] Whoever, while in a state of intoxication, prescribes or administers any poison, drug, or medicine to another, which endangers the life of such other person, shall be fined not exceeding one hundred dollars, and imprisoned not more than twenty days. (6813; 32 v. 20.)

SEC. 139. [Administering secret medicine.] Whoever prescribes any drug or medicine to another, the true nature and composition of which he does not, if inquired of, truly make known, but avows the same a secret medicine or composition, and thereby endanger the life of such other person, shall be fined not exceeding one hundred dollars, and imprisoned not more than twenty days. (6814; 32 v. 20.)

SEC. 140. [Attempting to procure abortion; punishment if the woman dies or miscarries.] Whoever, with intent to procure the miscarriage of any woman, prescribes or administers to her any medicine, drug, or substance whatever, or, with like intent, uses any instrument or means whatever, unless such miscarriage is necessary to preserve her life, or is advised by two physicians to be necessary for that purpose, shall, if the woman either miscarries or dies in consequence thereof, be imprisoned in the penitentiary not more than seven years nor less than one year. (6815; 32 v. 20.)

The offense is complete if the medicine, drug, or substance be administered, or instruments used, with the intent prescribed, at any time during the period of gestation: *Wilson v. State*, 2 O. S. 319.

SEC. 141. [Administering anæsthetics without the presence of a witness.] Whoever uses upon another an anæsthetic, unless at its administration, and during the whole time the person is wholly or partly under the direct influence of it, there is present a third person competent to be a witness, shall be fined not more than twenty-five nor less than five dollars. (6990; 73 v. 154.)

DENTIST.

SEC. 142. [Who may practice dentistry.] No person shall practice dentistry for compensation, without having received a diploma from the faculty of a dental college of either this or a foreign country, or a certificate of qualification issued by the state dental society, or by any local society auxiliary thereto; but when a person has been continuously engaged in the practice of dentistry for a period of five years or more, he shall be considered to have complied with the provisions of this chapter. (4404; 70 v. 58.)

SEC. 143. [Practicing dentistry without qualification.] Whoever practices dentistry for compensation, without having received a diploma from the faculty of a dental college of this or a foreign country, or a certificate of qualification by the state dental society, or by a local society auxiliary thereto, shall be fined not more than two hundred nor less than fifty dollars; but this section shall not apply to physicians and surgeons. (6991; 65 v. 165.)

DIVISION VII.

Relating to Oils and Explosives.

PETROLEUM OILS.

SEC. 144. [Manner of inspection of petroleum oils.] All mineral or petroleum oil, or any oil fluid or substance which is a product of petroleum, or into which petroleum or any product of petroleum enters or is found as a constituent element, whether manufactured within this state or not, shall be inspected, as provided in this chapter, before being offered for sale or sold for consumption for illuminating purposes within the state, and such inspection shall be conducted as herein provided, in the following manner:

The test shall be made in a test cup of metal or glass, cylindrical in shape, two and a quarter inches in diameter, and four inches deep, both measurements being made inside the cup, and this cup shall be filled to within one quarter of an inch of the brim with the oil or other substance to be tested, taken at the ordinary temperature; the cup shall be placed in a water-bath sufficiently large to leave a clear space of one inch under the cup, and three-eighths of an inch around it, and in such manner as to project about one-quarter of an inch above the water-bath; the space between the cups and the water-bath shall be nearly filled with cold water taken at the ordinary temperature, and the cup being placed in the water-bath, the latter shall be heated by an alcohol lamp, with its flame so graduated that the rise in temperature from sixty degrees Fahrenheit to the

highest heat test temperature shall not be less than two degrees per minute, and shall be as near two degrees per minute as is practicable, and shall in no case exceed four degrees per minute. A Fahrenheit thermometer shall be suspended in such a manner that the upper surface of its bulb shall be as near as practicable one quarter of an inch below the surface of the oil undergoing test; as soon as the temperature reaches the point of ninety-eight degrees Fahrenheit, the lamp shall be removed from under the water-bath, and the oil shall then be allowed to rise to the temperature of one hundred degrees Fahrenheit, by the residual heat of water, and at that point the first test for flash shall be made as follows: a taper, hereinafter described, shall be lighted and the surface of the oil shall be touched with the flame of the taper, and it is lawful to apply this flame, either to the center of the oil surface or to any or all parts of it, but the taper itself shall not be plunged into the oil, and if no flash takes place upon the first contact of the flame with the oil, the taper shall not be held in longer contact, but shall be immediately withdrawn; if no flash takes place at the temperature of one hundred degrees Fahrenheit, the lamp shall be replaced under the water-bath, and the temperature raised to one hundred and three degrees, when the lamp shall be again withdrawn, and the oil allowed to rise to one hundred and five degrees by the residual heat of the water, when the test shall be made at one hundred and five degrees by again applying the flame of the taper as hereinbefore specified: if no flash occurs, the test shall be repeated as often as the oil gains five degrees in temperature, three degrees with the lamp under the water-bath, and two degrees with the lamp removed; these tests shall be repeated until a flash is obtained; the inspector shall further test the oil by applying the taper at every two degrees rise, without removing the lamp or stirring, but if a flash is obtained by this means by a less rise in temperature than five degrees herein required, he shall at once remove the lamp, stir the oil, and immediately apply the flame; the taper used for testing may be made of any wood giving a clear flame, and it shall be made as slender as possible and with a tip not more than one-sixteenth of an inch in thickness; no taper or match with sulphur upon it shall be used, unless the sulphur is removed before lighting; when the taper is lighted it shall be applied to the oil immediately, that is to say, before an ash or coal has had time to form on the end of the taper beyond the flame, and in applying the taper the flame shall be made to touch the oil, but the taper itself shall not be brought in contact with the oil, and if the taper is so brought in contact with the oil, but not held there longer than for the space of one second, and the oil flashes, the test shall not thereby be vitiated, but the inspector shall immediately remove the lamp, and again test the oil by the flame without allowing the body of the taper to touch the oil; no oil or other substance, which, by the test herein described, flashes at any temperature below one hundred and twenty degrees Fahrenheit, shall be allowed to be sold, or offered for sale, or consumed for illuminating purposes in this state; but it shall be deemed a sufficient compliance with the provisions of this section to test the oil or oils herein described by an apparatus known as the "Foster cup" or Foster's automatic oil tester; and it is lawful to sell, for illuminating purposes, any oil or oils herein described, to be consumed within the state, which bear a flash test of one hundred and twenty degrees Fahrenheit, as shown by said apparatus, and the state inspector is hereby authorized to substitute the test by the Foster cup, or Foster's automatic oil tester, instead of the test by the open cup, as

herein provided, if, in his judgment, by such change a greater uniformity of test throughout the state will be secured. (394; 81 v. 140.)

SEC. 145. [State inspector of oils; appointment and term of; empowered to appoint deputies; duties of; rejected oil.] Immediately upon the taking effect of this act, the governor shall appoint, by and with the advice and consent of the senate, a skilled and suitable person, who is not interested in manufacturing, dealing, or reducing any illuminating oils manufactured from petroleum, as state inspector of oils, whose term of office is for two years, to commence from the fifteenth day of May, 1884, and continue until his successor is appointed and qualified; and in case of a vacancy occurring by death, resignation, or otherwise, the governor shall fill the same as provided in section twelve of the revised statutes of Ohio; provided that the present state supervisor of oils shall continue in office and perform the duties of state supervisor of oils, under this act until May 15, 1884. The inspector, when so appointed and qualified, is empowered to appoint a suitable number of deputies who are not interested in manufacturing, dealing, or vending any illuminating oils manufactured from petroleum, who are empowered to perform the duties of inspection, and are liable to the same penalties as the inspector; and the inspector may remove any of the deputies for reasonable cause, and appoint others in their place; provided, that all deputy supervisors of oils now in office shall remain and perform the duties thereof, under this act, until May 15, 1884. The inspector and his deputies shall provide themselves, at their own expense, with the necessary instruments and apparatus, and stencils, brands and stamps, for testing and marking the quality of illuminating oils, and when called upon for that purpose to promptly inspect all oils herein mentioned, and to reject for illuminating purposes, for consumption in this state, all oils which, by being adulterated with naphtha, benzine, paraffine, or other light oils or other substance, or for any other reason, will not stand and be equal to the test herein prescribed. The inspector shall prepare the forms of all stencils, brands, and stamps provided for in this chapter, and also such general regulations and rules for inspection, not inconsistent with the terms and provisions of this chapter, and such rules and regulations shall be binding on all deputy inspectors in the state. The inspector and his deputies are required to test the quality of all mineral or petroleum oils, or any oil, fluid or substance which is a product of petroleum or into which petroleum or any product of petroleum enters, or is found as a constituent element, which is offered or intended to be offered for sale for illuminating purposes in this state, and if upon such testing or examination the same meets the requirement herein specified, the inspector or his deputies shall affix by stencil or brand, on any package, cask or barrel containing the same, and by a stamp subscribed with his official signature, the word "approved," with the date of such inspection; and it will then be lawful for any manufacturer, vendor, or dealer, to sell the same, to be consumed within the state as an illuminator; but if the oil so tested does not meet such requirements, he shall mark by stencil or brand, in plain letters on any package or barrel containing the same, and by a stamp subscribed with his official signature, the words "rejected for illuminating purposes," giving the date of such inspection; and it shall be unlawful for the owner thereof to sell oil so branded as rejected, to be consumed within the state for illuminating purposes; and if any person sells or offers for sale such rejected oil, he shall be deemed guilty of a misdemeanor, and shall be subject to a penalty in any sum not less than one thousand dollars, or be imprisoned in the county jail not exceeding twenty days, or both. (395; 81 v. 142.)

SEC. 146. [Oath and bond of inspector and deputy; fees of; record of inspection to be kept; deputies to make monthly returns to inspector.] Whoever is appointed state inspector or deputy inspector shall, before he enters upon the discharge of the duties of his office, take an oath of office, and file the same in the office of the secretary of state.

The inspector must execute a bond to the state in the sum of twenty thousand dollars, with sureties to be approved by the secretary of state, conditioned for the faithful performance of the duties imposed upon him by law, which bond shall be for the use of all persons in any way aggrieved or injured by the acts or neglect of the inspector, and the same shall be filed with the secretary of state.

The deputy inspectors must each execute a bond to the state in the sum of five thousand dollars, with sureties to be approved by the judge of probate of the county where the deputy is located, and file the same with the clerk of the court of common pleas in the county where he resides. The inspector or deputy inspector is entitled to demand and receive from the owner or party calling on him, or for whom he performs the inspection, the sum of forty cents for a single barrel, package, or cask; twenty-five cents, each, when the lot does not exceed ten in number; fifteen cents, each, when the lot does not exceed twenty in number; ten cents, each, when the lot does not exceed fifty in number; and five cents, each, of all lots exceeding fifty barrels; and all fees so accruing shall be a lien on the oil so inspected. Every inspector or deputy inspector shall keep a true and accurate record of all oils so inspected and branded by him, which record shall state the date of the inspection, number of barrels, and the name of the person for whom inspected, and such record shall be open to the examination of any and all persons interested; and every deputy inspector shall, on the first Monday of each month, make a true and accurate return to the state inspector of all such inspections for the preceding month, giving the quantity inspected, the date of the inspection, and the name of the person for whom it is inspected; on the second Monday of November of each year, the state inspector shall make and deliver to the governor a report of the inspections, by himself and deputies during the preceding calendar year. (396; 81 v. 143.)

SEC. 147. [Penalty for sale of uninspected oils; for using false brands, etc.] If any person for or as agent for any other person shall sell, or attempt to sell, to any person in this state any such oils to be consumed within this state for illuminating purposes, whether manufactured in this state or not, before having the same inspected as provided in this chapter, he shall be fined in any sum not less than one hundred and not exceeding three hundred dollars; and if any person shall falsely brand any package, cask or barrel, as provided in section 394, or shall refill and use any package, cask or barrel having the inspector's brand thereon, without having the oil therein inspected, he shall be fined in any sum not exceeding five hundred dollars nor less than one hundred dollars, or be imprisoned in the county jail not exceeding six months, or both, at the discretion of the court. (397; 81 v. 143.)

SEC. 148. [For using uninspected oil] Whoever knowingly uses for illuminating purposes, any oil or product of petroleum, before the same has been inspected and branded by the state inspector, or his deputy, as hereinbefore provided, shall be fined in any sum not exceeding one hundred dollars, nor less than twenty dollars. (398; 81 v. 144.)

SEC. 149. [For selling casks without defacing brand.] Any per-

son selling or dealing in illuminating oils produced from petroleum, who sells or disposes of any empty barrel, cask or package which has been branded by the inspector, or a deputy inspector, before thoroughly canceling, removing and effacing the inspector's brand on the same, shall be fined fifty dollars (\$50) for each barrel, cask or package thus sold or disposed of. (399; 81 v. 144.)

SEC. 150. [Oils shall not be adulterated.] No person may adulterate with any substance whatever, for the purpose of sale, or for illuminating purposes, any oil obtained from petroleum, or obtained from coal, in such manner as to render it dangerous to use; nor shall any person knowingly sell or offer for sale any oil obtained from petroleum, or from coal, or from the products of either, for illuminating purposes within this state, which by reason of being adulterated, or for any reason whatever, will flash at a temperature less than one hundred and twenty degrees of Fahrenheit's thermometer and the test herein prescribed; but oils not bearing the test herein prescribed, may be used in street lamps for lighting streets or public wharves, ways or alleys, and also the gas or vapor from such oils may be used for illuminating purposes, when the oils from which said gas or vapor is generated, are contained in reservoirs under ground, outside the building illuminated or lighted by the gas or vapor, and a person violating any of the provisions of this section shall be punished by imprisonment in any county jail not more than one year, or by a fine not exceeding five hundred dollars (\$500), or by such fine and imprisonment at the discretion of the court. (400; 81 v. 144.)

SEC. 151. [Responsibility of dealers in oils.] Whoever shall sell or keep for sale, to be consumed in the state, any illuminating oil manufactured from petroleum or its products, and not inspected as provided in this chapter, shall be responsible to the party or parties injured for any violation of the provisions of this chapter by himself or by any clerk or person in his employ, in the sale of such oil. (401; 81 v. 144.)

SEC. 152. [Duties of inspector and deputies as to violations of law.] The inspector, or any deputy inspector, who shall know of the violation of any of the provisions of this chapter, shall enter complaint before any court of competent jurisdiction, against any person so offending; and in case any inspector, or deputy inspector, having knowledge of the violation of the provisions of this chapter, shall neglect to enter complaint as required by and provided for in this chapter, he shall be fined in any sum not exceeding five hundred dollars, and be removed from his position as such inspector or deputy inspector. (402; 81 v. 145.)

SEC. 153. [Inspector or deputy not to traffic in oils; disputes: to whom submitted.] No inspector or deputy inspector shall, while in office, traffic directly or indirectly, in any article in which petroleum or other product thereof is a constituent part, which he is appointed to inspect, and in case of any violations of the provisions of this section by any inspector, or deputy inspector, he shall be fined in any sum not exceeding five hundred dollars, and be removed from his position as such inspector or deputy inspector. All questions of dispute arising between the inspectors and manufacturers or dealers, shall be submitted to the professor of chemistry in the Ohio state university at Columbus, for consideration, and his decision shall be final. (403; 81 v. 145.)

SEC. 154. [Liability for damages.] Whoever shall knowingly sell or cause to be sold, any oil mentioned in this chapter, for illuminating purposes, which is below one hundred and twenty degrees Fahrenheit,

when tested as provided in section 394, shall be liable to any person purchasing any of such oil, or to any person injured thereby, for all damages resulting from any explosion thereof, and it shall be no defense that the inspector's brand was upon the cask, or package or barrel from which the oil was taken. (404; 81 v. 145)

SEC. 155. [Adulterating coal oil.] Whoever adulterates, with any substance whatever, for the purpose of sale, or for use for illuminating purposes, any oil obtained from petroleum or coal, in such manner as to render it dangerous to use, or knowingly sells or offers for sale, or knowingly uses any oil obtained from petroleum or coal, or the products of either, for illuminating purposes within this state, which, by reason of being adulterated, or for any reason whatever, will flash at a temperature less than one hundred and twenty degrees of Fahrenheit's thermometer, under the test prescribed law, shall be imprisoned not more than one year, or fined not more than five hundred dollars, or both; but the provisions of this section do not extend to oils used in street lamps for lighting streets, public wharves, ways, or alleys, nor to the use of the gas or vapor from such oils, when the oil from which such gas or vapor is generated is contained in reservoirs under ground, outside the building lighted or illuminated by such gas or vapor. (6954; 75 v. 564.)

DYNAMITE.

SEC. 156. [Manufacture, storing and transporting of nitro-glycerine.] Whoever manufactures the substance or material generally known as and called nitro-glycerine, or any compound thereof, within one hundred and sixty rods of any occupied dwelling or public building, or stores the same, in any quantity exceeding one hundred pounds, within the limits of any municipal corporation, or within one hundred and sixty rods of any occupied dwelling or public building, or transports or carries the same in any package not having written or printed, upon two sides thereof, in plain and distinct letters, the words "Nitro glycerine—dangerous," or in any vehicle or watercraft upon which any passenger is at the same time being conveyed, or in any vehicle upon the sides and ends of which there shall not have been printed, in plain and distinct letters, large enough to occupy a space two inches wide by eighteen inches long, the words "Nitro-glycerine—dangerous," shall be fined not more than one thousand dollars, or imprisoned not more than three months, or both. (6953; 68 v. 105.)

SEC. 157. [Firing cannon or exploding gunpowder on public street.] Whoever, except in case of invasion by a foreign enemy, or to suppress insurrection or a mob, or for the purpose of raising the body of a person drowned, or for the purpose of blasting or removing rock, fires any cannon, or explodes at any time more than four ounces of gunpowder, upon any public street or highway, or nearer than ten rods to the same, shall be fined not more than fifty nor less than five dollars. (7004; 43 v. 17.)

SEC. 158. [Sale or use of dynamite, etc.] It shall be unlawful for any person, firm or corporation to manufacture, sell or use the substance or material known as and called dynamite or other nitro-explosive compound, within the state of Ohio, contrary to the provisions of this act. (8035-206; 82 v. 182.)

SEC. 159. [Application for license to manufacture the same.] Whoever desires to engage in the manufacture of dynamite or any com-

pound thereof, within the state of Ohio, shall first make application in writing to the common council of the city or incorporated village in which the same is to be located, or to the board of township trustees, if it is to be located without the corporate limits of a city or village, setting forth the fact of his or their intention to engage in the manufacture of dynamite or other nitro-explosive compound, the name in full of the person or persons comprising such firm, or, if a corporation, the names of the incorporators, an accurate description of the premises upon which it is to be located, and how far separated from other buildings, which statement shall be made under oath, signed by all the parties, or if a corporation, by the president and secretary thereof. (8035-207; 82 v. 182.)

SEC. 160. [License: how granted.] The common council of any city or incorporated village within this state, or the trustees of any township, may, by a majority vote of all the members elected thereto, at a regular meeting, upon application duly made under the provisions of this act, grant a certificate of license to any person, firm or corporation, authorizing the same to manufacture the substance or material known as dynamite or other nitro-explosive compound, in accordance with the conditions and restrictions hereinafter mentioned. (8035-208; 82 v. 182.)

SEC. 161. [Penalties in regard to the manufacture, storage and transportation of dynamite.] It shall be unlawful for any person, firm or corporation to engage in the manufacture of dynamite or other nitro-explosive compound, within this state, without having first procured the certificate of license provided for in the preceding section, or within one hundred and sixty rods of any occupied dwelling or public building, except that the trustees of any township may, if in their judgment they deem it expedient and proper, authorize the location and establishment of such manufactory at a less distance than one hundred and sixty rods from any occupied dwelling, and it shall also be unlawful for any person, firm or corporation, to store dynamite or other nitro-explosive compound, in any quantity exceeding one hundred pounds, within the limits of any municipal corporation, or within forty rods of any occupied dwelling or public building, or to transport or carry the same in any package not having written or printed upon two sides thereof in plain and distinct letters the words "Dynamite—dangerous," or in any railroad car or water craft without having the packages containing the same marked as above; and any one convicted of the violation of the provisions of this section, shall be fined in any sum not less than three hundred nor more than five hundred dollars, or imprisoned in the county jail not less than three months nor more than one year, or both, at the discretion of the court. (8035-209; 82 v. 182.)

SEC. 162. [Sales to minors or without labels; sales registered; penalties for violations of this act.] It shall be unlawful for any person, firm or corporation to sell or give away any quantity of the substance known as dynamite or other nitro-explosive compound to any minor, or to sell or give away the same to any person without marking the word "dynamite" upon the label, wrapper, or vessel containing it, and shall also register in a book, to be by him kept for that purpose, the day and date upon which it is sold, or given away, the quantity thereof, the name, age, sex, color and place of residence of the person obtaining the same, the purpose for which it is required, and the name and place of abode of the person for whom the same is intended; and any person convicted of the violation of the provisions of this section, shall be fined in any sum not

less than one hundred dollars, or imprisoned in the county jail not less than three months, or both. (8035-210; 82 v. 183.)

SEC. 163. [Unlawful use and possession of dynamite.] Whoever carries concealed on or about his person any cartridge shell or bomb containing dynamite or other nitro-explosive compound, or has in his possession or under his control any dynamite or other nitro explosive compound, for any other than legitimate and lawful use or uses, or attempts to use the same in any manner to the injury of persons or property, or shall place or deposit the same upon or about the premises of another, without the consent of such person, shall, upon conviction thereof, be imprisoned in the penitentiary not less than five years. (8035-211; 82 v. 183.)

FIREARMS.

SEC. 164. [Penalty for selling or giving, etc., firearms to minors.] Whoever sells, barter, or gives away to any minor under the age of fourteen years, any air-gun, musket, rifle-gun, shot-gun, revolver, pistol or other fire-arm of any kind or description whatever, or ammunition for the same, or whoever being the owner, or having charge or control of any such air-gun, musket, rifle-gun, shot-gun, revolver, pistol, or other fire-arm knowingly permits the same to be used by such minor, shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be fined in any sum not exceeding one hundred dollars, or be imprisoned in jail not exceeding thirty days, or both. (6986a; 77 v. 79.)

SEC. 165. [Unlawful to sell toy pistols to minors under fourteen years; penalty.] It shall be unlawful for any firm, company or person in the state of Ohio, to sell or exhibit for sale any pistol, manufactured out of any metallic or hard substance, commonly known as the "toy pistol," to a minor under the age of fourteen years; any firm, company or person violating the provisions of this act, shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be fined not less than ten nor more than fifty dollars, or be imprisoned not less than ten days nor more than twenty days, or both, and shall be liable to a civil action in damages to any person injured by such sale. (6986b; 80 v. 222.)

SEC. 166. [Carrying concealed weapons.] Whoever carries any pistol, bowie-knife, dirk, or other dangerous weapon, concealed on or about his person, shall be fined not more than two hundred dollars, or imprisoned not more than thirty days; and, for a second offense, fined not more than five hundred dollars, or imprisoned not more than three months, or both. (6892; 56 v. 56.)

SEC. 167. [Pointing fire arms at, and discharging the same, and injuring thereby.] Whoever intentionally, and without malice, points or aims any firearm at or toward any person, or discharges any firearm so pointed or aimed, or maims or injures any person by the discharge of any firearm so pointed or aimed, shall be fined not more than one hundred dollars, or imprisoned not more than one year or both. This section shall not extend to any case when firearms are used in self-defense, or in the discharge of official duty, or in case of justifiable homicide. (6822; 72 v. 44.)

(This section was not intended to cover a case of homicide, but one where the maiming or injury does not produce death: *Williamson v. State*, 2 c. c., 292.)

DIVISION VIII.

Relating to Mines and Miners.

SEC. 168. [Their powers and duties.] The chief inspector and district inspectors shall give their whole time and attention to the duties of their offices, respectively; it shall be the duty of the district inspectors to examine all the mines in their respective districts as often as possible, to see that all the provisions and requirements of this chapter are strictly observed and carried out; they shall particularly examine the works and machinery belonging to any mine, examine into the state and condition of the mines as to ventilation, circulation and condition of air, drainage and general security; they shall make a record of all examinations of mines in their respective districts, showing the date when made, the condition in which the mines are found, the extent to which the laws relating to mines and mining are observed or violated, the progress made in the improvement and security of life and health sought to be secured by the provisions of this chapter, number of accidents, injuries received, or deaths in or about the mines, the number of mines in their respective districts, the number of persons employed in or about each mine, together with all such other facts and information of public interest concerning the condition of mines, development and progress of mining in their respective districts as they may think useful and proper, which record shall, on or before the first Monday of every month, be filed in the office of the chief inspector, to be by him recorded, and so much thereof as may be of public interest, to be included in his annual report; in case of any controversy or disagreement between a district inspector and the owner and [or?] operator of any mine, or the persons working therein, or in case of conditions of emergencies requiring counsel, the district inspector may call on the chief inspector for such assistance and council as may be necessary; should the district inspector find any of the provisions of this chapter violated, or not complied with, by any owner, lessee, or agent in charge of any mine, he shall immediately notify such owner, lessee, or agent in charge, of such neglect or violation, and unless the same is, within a reasonable time, rectified, and the provisions of this chapter fully complied with, he shall institute a prosecution under the provisions of section 6871 of the Revised Statutes. The inspectors shall exercise a sound discretion in the enforcement of the provisions of this act, and if in any respect (which is not provided against by, or may result from a rigid enforcement of any express provisions of this chapter), the inspector find any matter, thing or practice in or connected with any such mine, to be dangerous or defective, so as in his opinion to threaten or tend to the bodily injury of any person, the inspector may give notice in writing thereof to the owner, agent

or manager of the mine, and shall state in such notice the particulars in which he considers such mine, or any part thereof, or any matter, thing of [or?] practice to be dangerous or defective, and require the same to be remedied. For the purpose of making the inspection and examinations provided for in this section, the chief inspector and the district inspectors shall have the right to enter any mine at all reasonable times, by night or by day, but in such manner as shall not unnecessarily obstruct the working of the mine: and the owner or agent of such mine is hereby required to furnish the means necessary for such entry and inspection; the inspection and examination herein provided for shall extend to fire-clay, iron ore, and other mines, as well as coal mines. (292; 85 v. 106.)

SEC. 169. [Outlets required.] It is unlawful for the owner or agent of any coal mine, worked by shaft, to employ or permit any person to work therein, unless there are, to every seam of coal worked in each mine, at least two separate outlets, separated by natural strata of not less than one hundred feet in breadth, by which shafts or outlets distinct means of ingress and egress are always available to the persons employed in the mine; but it is not necessary for the two outlets to belong to the same mine, if the persons employed therein have safe, ready and available means of ingress and egress by not less than two openings. This section shall not apply to opening a new mine while being worked for the purpose of making communication between said two outlets, so long as not more than twenty persons are employed at any one time in such mine, neither shall it apply to any mine, or part of a mine in which the second outlet has been rendered unavailable by reason of the final robbing of pillars previous to abandonment, so long as not more than twenty persons are employed therein at any one time. The cage or cages, and other means of egress shall at all times be available for the persons employed, where there is no second outlet. The escapement shafts shall be fitted with safe and available appliances by which the persons employed in the mine may readily escape in case an accident occurs deranging the hoisting machinery at the main outlets, and such means or appliances for escape shall always be kept in a safe condition; and in no case shall an air shaft, with a ventilating furnace at the bottom, be construed to be an escapement shaft, within the meaning of this section. To all other coal mines, whether slopes or drifts, two such openings or outlets must be provided within twelve months after shipments of coal have commenced from such mine; and in case such outlets are not provided as herein stipulated, it shall not be lawful for the agent or owner of such slope or drift to permit more than ten persons to work therein at any one time. In case a coal mine has but one shaft, slope, or drift, for the ingress or egress of the men working therein, and the owner thereof does not own suitable surface ground for another opening, he may select and appropriate any adjoining land for that purpose, and may make an additional shaft or outlet under, through or upon any intervening land, or landing adjoining, and shall be governed in his proceeding in appropriating such land by the provisions of law in force, providing for the appropriation of private property by corporations, and such appropriation may be made, whether he is a corporator or not; but no land shall be appropriated under the provisions of this chapter until the court is satisfied that suitable premises can not be obtained upon reasonable terms. (297; 85 v. 185.)

SEC. 170. [Ventilation.] The owner or agent of every coal mine, whether shaft, slope or drift, shall provide and maintain for every such mine, an amount of ventilation of not less than 100 cubic feet, per minute,

per person employed in such mine, which shall be circulated and distributed throughout the mine in such a manner as to dilute, render harmless, and expel the poisonous and noxious gases from each and every working-place in the mine, and no working-place shall be driven more than sixty feet in advance of a break-through, or air-way; and all break-throughs, or air-ways, except those last made near the working-faces of the mine shall be closed up and made air-tight, by brattice, trap doors, or otherwise, so that the currents of air in circulation in the mine may sweep to the interior of the mine where the persons employed in such mine are at work, and all mines governed by the statute shall be provided with artificial means of producing ventilation, such as forcing, or suction fans, exhaust steam, furnaces or other contrivances, of such capacity and power as to produce and maintain an abundant supply of air, and all mines generating fire-damp shall be kept free from standing gas, and every working-place shall be carefully examined every morning with a safety lamp by a competent person or persons, before any of the workmen are allowed to enter the mine. All underground entrances to any places not in actual course of working or extension, shall be properly fenced across the whole width of such entrances so as to prevent persons from inadvertently entering the same. (298; 83 v. 182.)

SEC. 171. [Safety apparatus and precautions; boilers.] The owner or agent of every coal mine operated by shaft, in all cases where the human voice can not be distinctly heard, shall forthwith provide and maintain a metal tube from the top to the bottom of such shaft suitably calculated for the free passage of sound therein, so that conversation may be held between persons at the bottom and top of the shaft; there shall also be provided an approved safety catch, and a sufficient cover overhead, on all carriages used for lowering and hoisting persons, and in the top of every shaft an approved safety gate, and an adequate brake shall be attached to every drum or machine used for lowering or raising persons in all shafts or slopes; and there shall also be provided in every shaft a traveling or passage way from one side of a shaft bottom to the other, so that persons working therein may not have to pass under descending cages; and all slopes or engine-planes, used as traveling ways by persons in any mine, shall be made of sufficient width to permit persons to pass moving cars with safety; but if found impracticable to make any slope or engine-plane of sufficient width, then safety-holes of ample dimensions, and not more than sixty feet apart, shall be made on one side of said slope or engine-plane. Such safety-holes shall always be kept free from obstructions, and the roof and sides shall be made secure. The boilers used for generating steam, and the buildings containing the boilers shall not be nearer than sixty feet to any shaft or slope, or to any building or inflammable structure connected with or surrounding said shaft or slope; but this section shall not apply to any shaft or slope, until the work of development and shipment of coal has commenced. (299; 83 v. 182.)

SEC. 172. [Competent engineers must be employed, etc.] No owner or agent of any coal mine operated by a shaft or slope shall place in charge of any engine used for lowering into or hoisting out of such mine persons employed therein any but experienced, competent, and sober engineers; and no engineer in charge of such engine shall allow any person, except such as may be deputed for that purpose by the owner or agent, to interfere with it or any part of the machinery, and no person shall interfere or in any way intimidate the engineer in the discharge of his duties; and in no case shall more than ten men ride on any cage or

car at one time, and no person shall ride upon a loaded cage or car in any shaft or slope. (300; 71 v. 21.)

SEC. 173. [Lighting and ventilation; notice of accidents, duty of inspectors; penalty; other notices to be given chief inspector of mines.] All safety lamps used for examining coal mines, or which are used in any coal mine, shall be the property of the owner of the mine and shall be under the charge of the agent thereof, and in all mine whether they generate fire-damp or not, the doors use[d] in assisting or directing ventilation of the mine, shall be so hung or adjusted that they will shut of their own accord and can not stand open; and all main doors shall have an attendant, whose constant duty shall be to open them for transportation and travel, and prevent them from standing open longer than is necessary for persons or cars to pass through; and the mining boss shall keep a careful watch over the ventilating apparatus and the airway, and he shall measure the ventilation at least once a week, at the inlet and outlet, and also at or near the face of all the entries, and the measurements of air so made shall be noted on blanks, furnished by the chief inspector; and on the first day of each month the mining boss of each mine shall sign one of such blanks, properly filled with the said actual measurements, and forward the same to the chief inspector, and any mining boss making false returns of such air measurements shall be deemed guilty of an offense against this section. Every person having charge of any mine, whenever loss of life occurs by accident, connected with the working of such mine, or by explosion, shall give notice thereof forthwith, by mail or otherwise, to the inspector of mines, and to the coroner of the county in which such mine is situated, and the coroner shall hold an inquest upon the body of the person or persons whose death has been caused, and inquire carefully into the cause thereof, and shall return a copy of the finding and all the testimony to the chief inspector. The owner, agent, or manager of every mine shall, within twenty-four hours next after any accident or explosion, whereby loss of life or personal injury may have been occasioned, send notice in writing to the chief inspector, and shall specify in such notice the character and cause of the accident, and the name or names of persons killed and injured, with the extent and nature of the injuries sustained. When any personal injury, of which notice is required to be sent under this section, results in the death of the person injured, notice in writing shall be sent to the chief inspector within twenty-four hours after such death comes to the knowledge of the owner, agent or manager; and when loss of life occurs in any mine by explosion, or accident, the owner, agent, or manager of such mine shall notify the chief inspector, or the district inspector, forthwith, of the fact, and it shall be the duty of the chief inspector to go himself, or require one of the district inspectors to go, at once to the mine in which said death occurred, and inquire into the cause of the same, and to make a written report, fully setting forth the condition of the part of the mine where such death occurred, and the cause which led to the same; which report shall be filed by the chief inspector in his office as a matter or [of] record, and for future reference.

For any injury to persons or property, occasioned by any violation of this act, or any willful failure to comply with its provisions by any owner, agent or manager of any mine, a right of action shall accrue to the party injured, for any direct damage he may have sustained thereby; and, in any case of loss of life, by reason of such willful neglect or failure, aforesaid, a right of action shall accrue to the widow and lineal heirs of the

person whose life shall be lost, for like recovery of damages for the injury they shall have sustained.

The owner, agent, or manager of any mine shall also give notice to the chief inspector of mines in any or all of the following cases:

1. Where any change occurs in the name of any mine, or in the name of any owner, agent, or manager of any mine, or in the officers of any incorporated company which owns or operates a mine.

2. Where any working is commenced for the purpose of opening a new shaft, slope or mine, to which this act applies.

3. Where any mine is abandoned or the working thereof discontinued.

4. Where the working of any mine is re-commenced after any abandonment or discontinuance for a period exceeding three months.

5. Where the pillars of a mine are about to be removed or robbed.

6. Where a squeeze or crush, or any other cause or change may seem to affect the safety of persons employed in any mine, or where fire occurs, or a dangerous body of gas is found in any mine. (301; 85 v. 185.)

SEC. 174. [Employment of minors.] No boy under twelve years of age shall be allowed to work in any mine, nor any minor between the ages of twelve and sixteen years unless he can read and write; and in all cases of minors applying for work, the agent of such mine shall see that the provisions of this section are not violated; and the mine inspector may, where doubt exists as to the age of any minors found working in any mine, qualify the said minor or his parents as to his age (302; 85 v. 325.)

SEC. 175. [Action for non-compliance with statutes.] In case any coal mine does not, in appliances for the safety of the persons working therein, conform to the provisions of this chapter, or the owner or agent disregards the requirements of this chapter, any court of competent jurisdiction may, on application of the inspector, by civil action in the name of the state, enjoin or restrain the owner or agent from working or operating such mine until it is made to conform to the provisions of this chapter; and such remedy shall be cumulative, and shall not take the place of or affect any other proceedings against such owner or agent authorized by law for the matter complained of in such action. (303; 85 v. 325.)

SEC. 176. [Mines to which certain statutes do not apply.] The provisions of this chapter shall not apply to or affect any coal mine in which not more than ten men are employed at the same time; but the inspector shall at all times have free ingress to such mines for the purpose of examination and inspection, and shall direct and enforce any regulations in accordance with the provisions of this chapter that he may deem necessary for the safety of the health and lives of the minors employed therein. (306; 85 v. 325.)

SEC. 177. [Mines: penalty for injuring.] Whoever knowingly violates any of the provisions of sections 297, 298, 299, 300, 301, 302, and 305, or does any act whereby the life or health of the persons, or the security of any mine and machinery are endangered, or any miner or other person, employed in any mine governed by the statute, who intentionally and willfully neglects or refuses to securely prop the roof of any working place under his control, or neglects or refuses to obey any order given by the superintendent of a mine, in relation to the security of the mine in the part thereof where he is at work, and for fifteen feet back from

the face of his working place, or any miner, workman or other person, who shall knowingly injure any water-gauge, barometer, air-course or brattice, or shall obstruct or throw open any air-ways, or shall handle or disturb any part of the machinery of the hoisting engine, or open a door of the mine and not have the same closed again, whereby danger is produced either to the mine or those that work therein, or who shall enter any part of the mine against caution, or who shall disobey any order given in pursuance of this act, or who shall do any willful act, whereby the lives and health of persons working in the mine, or the security of the mine, or the machinery thereof is endangered, or any person having charge of a mine, whenever loss of life occurs by accident connected with the working of such mine, or by explosion, who neglects or refuses to give notice thereof forthwith, by mail or otherwise, to the chief inspector of mines, and to the coroner of the county in which such mine is situate, or any such coroner who neglects or refuses to hold an inquest upon the body of the person whose death has been thus caused, and return a copy of his findings and all the testimony to the inspector, shall be fined not less than fifty dollars, or imprisoned in the county jail not more than thirty days, or both. The owner, agent, or operator of every coal mine shall keep a supply of timber constantly on hand, and shall deliver the same to the working place of the miner, and no miner shall be held responsible for accidents which may occur in mines where the provisions of this section have not been complied with by the owner, agent, or operator thereof. (6871; 86 v. 301.

DIVISION IX.

RELATING TO

Shops and Factories: Public Buildings.

INSPECTOR OF WORKSHOPS AND FACTORIES.

SEC. 178. [Appointment of inspectors.] The governor shall appoint one chief inspector, by and with the advice and consent of the senate, who, with the approval of the governor, shall appoint three district inspectors. The chief inspector and district inspectors shall be competent and practical mechanics. The chief inspector shall hold his office for a term of four years, and shall have his office in the state-house, where shall be kept the records of his office, and the district inspectors shall hold their office for the term of three years from the first day of May after their respective appointments, and until their successors are appointed and qualified; the first appointments hereunder shall be made within thirty days from the passage of this act; in case of the resignation, removal or death of the chief inspector, the vacancy shall be filled in the manner above provided for original appointments for the unexpired term only of the position so made vacant. (2573a, 2; 82 v. 178.)

SEC. 179. [Duties of inspectors.] The chief inspector and district inspectors shall give their whole time and attention to the duties of their offices respectively; it shall be their duty to visit all shops and factories in their respective districts as often as possible, to see that all the provisions and requirements of this act are strictly observed and carried out; they shall carefully inspect the sanitary condition of the same, [and it shall be their duty] to examine the system of sewerage in connection with said shops and factories, the situations and conditions of water closets or urinals in and about such shops and factories, and also the system of heating, lighting and ventilating all rooms in such shops and factories where persons are employed at daily labor; also as to the means of exit from all such places in case of fire or other disaster, and also all belting, shafting, gearing, elevators, drums and machinery of every kind and description in and about such shops and factories, and see that the same are not located so as to be dangerous to employes when engaged in their ordinary duties, and that the same, so far as practicable, are securely guarded, and that every vat, pan or structure filled with molten metal or hot liquid shall be surrounded with proper safeguards for preventing accident or injury to those employed at or near them; and that all such are in a proper sanitary condition, and are adequately provided with means of escape in case of fire or other disaster. (2573a, 3; 82 v. 178)

SEC. 180. [Inspector to have free access to all shops and factories.] Said inspector shall have entry into all such shops and factories, including all public institutions of the state which have shops and factories, or either, at any reasonable time, and it shall be unlawful for the proprietors, agents or servants in such factories or shops to prevent, at reasonable hours, his entry into such shops and factories for the purpose of such inspection. (2573b; 86 v. 178.)

SEC. 181. [Notice of necessary alterations or additions; penalty for not making same.] Said inspectors, if they find upon such inspection that the heating, lighting, ventilation or sanitary arrangement of any such shop or factory is such as to be injurious to the health of persons employed or residing therein, or that the means of egress in case of fire or other disaster is not sufficient, or that the belting, shafting, gearing, elevators, drums and machinery in such shops and factories are located so as to be dangerous to employes, and not sufficiently guarded, or that the vats, pans or structures filled with molten metal or hot liquid, are not surrounded with proper safeguards for preventing accident or injury to those employed at or near them, shall notify the owners, proprietors or agents of such shops or factories to make the alterations or additions necessary within thirty (30) days, and if such alterations or additions are not made within thirty (30) days from the date of such notice, or within such time as said alterations can be made with proper diligence upon the part of such proprietors and owners, said proprietors, owner or agent so notified shall be deemed guilty of a misdemeanor, and upon conviction thereof, shall be fined not more than two hundred (200) and not less than ten (10) dollars, which fine shall be paid into the treasury of the county in which conviction is had. (2573c; 82 v. 178.)

SEC. 182. [Public halls, etc., "shops and factories" defined.] The term "shops and factories," as used in sections 2573b and 2573c of the Revised Statutes of Ohio, shall be held to include the following: Manufacturing, mechanical, electrical, mercantile, art and laundrying establishments, printing, telegraph and telephone offices, and hotels. And in case it is found on an inspection under section 2573c that the means of egress

in case of fire or other disaster is not sufficient in any shop or factory as defined herein, the owner or agent for the owner of such building may be required by the state inspector, upon the notice and under the penalties of said section 2573c to provide the necessary fire-escapes. (1891, March 2; 2573d; 88 v. 64)

SEC. 183. [Forbidding employment of minors under fourteen years of age in manufactories or mines.] No minor under the age of fourteen years shall be employed in any factory, workshop or establishment wherein the manufacture of any goods of any kind is carried on, or in any of the mines in this state; provided, that this act shall not apply to children more than twelve years of age laboring not more than eight hours per day during the time they are not required by law to attend school in such manufacturing institutions and at such employment therein as the inspector of workshops and factories may find to be not detrimental to such child. (1891, April 25: 6986; 88 v. 396.)

SEC. 184. Employment of minors under the age of eighteen in manufactories; notice; record.] No minor under the age of eighteen years shall be employed in any of the places named for a longer period than ten hours a day, and in no case shall the hours of labor exceed sixty in one week; and every employer shall post in a conspicuous place in every room where such persons are employed a printed notice, stating the number of hours required of them in each day of the week; the form of such printed notice shall be furnished by the chief inspector of workshops and factories, and shall be approved by the attorney-general; and it shall also be the duty of every employer of minors to keep a record, which shall be open to the inspection of the chief inspector of workshops and factories and of his assistants, giving the name of each minor employed, his or her name, date and place of birth, and also present residence, of the parents or guardians. (6986aa; 84 v. 249.)

SEC. 185. [Penalty for violations of this act.] Any person or corporation who shall employ any person contrary to the provisions of this act, or who shall violate any of the provisions of this act, shall upon conviction thereof, be fined in any sum not less than fifty nor more than one hundred dollars, or imprisoned not less than thirty, nor more than ninety days. (6986bb; 82 v. 162.)

SEC. 186. [Duty of inspector of shops; fines collected.] It shall be the duty of the inspector of shops and factories to prosecute all violations of this act, when the same shall come to his knowledge, in any court of competent jurisdiction. All fines collected under this act shall inure to the benefit of the school fund of the district where the offense was committed. (6986c; 82 v. 162.)

SEC. 187. [Preventing the employment of children in certain occupations.] No child under the age of sixteen years, shall be employed by any person, firm, or corporation in this state, at employment whereby its life or limb is endangered, or its health is likely to be injured, or its morals may be depraved by such employment. (1890, April 8: 87 v. 161.)

SEC. 188. [Penalty for violation.] Any person, firm, or corporation in this state, who willfully causes or permits the life or limb of any child under the age of sixteen years to be endangered, or its health to be injured, or its morals to become depraved, from and while actually in their employ, or who willfully permits such child to be placed in such a position or to engage in such employment that its life or limb is in dan-

ger, or its health likely to be injured, or its morals likely to be impaired by such position or employment, shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be fined in any sum not less than ten (10) dollars nor more than fifty (50) dollars, or imprisonment not less than thirty nor more than ninety days for each and every offense. (1890, April 8: 87 v. 161.)

SEC. 189. [**Duty inspector workshops and factories.**] It shall be the duty of the state inspector of workshops and factories to enforce the provisions of this act. (1890, April 8: 87 v. 161.)

SEC. 190. [**Female employes; for preservation of health of.**] Every person or corporation employing female employes in any manufacturing, mechanical or mercantile establishment in this state, shall provide suitable seats for the use of the female employes, so employed, and shall permit the use of such by them when they are not necessarily engaged in the active duties for which they are employed, and shall permit the use of such seats at all times when such use would not actually and necessarily interfere with the proper discharge of the duties of such employes; and shall also provide, on the same floor or floors of the building wherein any female persons are employed, suitable and separate toilet and dressing-rooms and water-closets for the exclusive use of such female employes. The state inspector of factories and workshops is hereby charged with the duty of seeing that the provisions of this section are observed and enforced. (1891, March 6; 8035-235; 88 v. 87.)

SEC. 191. [**Penalty.**] Any person or corporation violating any of the provisions of this act shall be punished by a fine of not less than ten dollars nor more than twenty-five dollars for each offense. (8035-236; 82 v. 132.)

SEC. 192. [**Manufacturers to report certain accidents to chief inspector of workshops.**] It shall be the duty of all manufacturers of the state, to forward by mail to the chief inspector of workshops and factories, at Columbus, a report of each and every serious accident, resulting in bodily injury to any person, which may occur in their establishment, giving particulars of the same as fully as can be ascertained, upon blanks which shall be furnished by the chief inspector of workshops and factories. If death shall result to any employe from any such accident, said report shall contain the age, name, sex and employment of the deceased, whether married, the number of persons, if any, deprived of support in consequence thereof, and the cause of the accident, if known. If the accident has caused bodily injury of such a nature as to prevent the person injured from returning to his or her employment within six or more days after the occurrence of the accident, then the report shall contain the age, name, sex and employment of the disabled, the nature and extent of the injury received, how caused, if known, how long continuously disabled, loss of time and wages therefrom, and if possible the expense thereby incurred in full. (7458-1; 85 v. 99.)

SEC. 193. [**Penalty for failure to so report; the term "manufacturer" defined.**] That any manufacturer who shall fail to comply with the requirement of this act in each case of death by accident within seven days thereafter, and in each case of injury by accident within thirty days thereafter, shall be fined in any sum not less than ten dollars nor more than fifty dollars. The term manufacturer, as applied in section one [7458-1] and in section two [7458-1, 7458-2] of this act, shall be held to mean any person who, as owner, manager, lessee, assignee, receiver,

contractor, or who, as agent of any incorporated company makes or causes to be made any kind of goods or merchandise, or who owns, controls, or operates any street railway, laundrying establishment, or is engaged in the construction of buildings, bridges or structures, or in loading or unloading vessels, or cars, or moving heavy materials, or operating dangerous machinery, or in the manufacture or use of explosives. (7458-2; 85 v. 99.)

SEC. 194. [Blanks for reports to be furnished by chief inspector of workshops; proviso.] It shall be the duty of the chief inspector of workshops and factories to supply all blanks necessary to make said reports as required in this act, and to prosecute all violations of this act when the same shall come to his knowledge; provided, that the furnishing of said blanks shall be a condition precedent to prosecution in any case. (7458-3; 85 v. 99.)

DANGEROUS BUILDINGS.

SEC. 195. [To prevent the erection of dangerous buildings.] It shall be unlawful for any person, society, firm, agent, representative of any private or corporate authority or society; or any committee, commission, or board acting under any authority whatsoever, to erect or cause to be erected, or for any architect, engineer, builder or other person to furnish any plan, description or specification for the purpose of erecting in the state of Ohio any structure, room or place where persons are invited, expected, or permitted to assemble; for the purpose of entertainment, judgment, amusement, instruction, betterment, treatment, or care; or to make any addition to or alteration therein, which shall in construction, arrangement, or means of egress be dangerous to the health or lives of persons so assembled. (7755-10; 86 v. 381.)

SEC. 196. [Capacity of stairways, approaches, doorways, etc.; floors; roof; walls; piers, pillars, arches, etc.; fire-escapes; ventilating, lighting, and heating apparatus.] In every such structure, room or place, capable of containing fifty or more persons, the stairways and approaches thereto and all doorways and escapes therefrom, in their aggregate width, shall be of sufficient capacity to allow any audience which can be accommodated therein to escape therefrom in four minutes, moving at a rate of two feet per second, and allowing four square feet of floor space to each person, then adding for hindrance two feet to the width of each opening, passage or stairway. The doors from the same shall open outward, but no such room, or place (unless the structure be fire-proof) which is over six feet from the surface of the lot shall have less than two doors, stairways or exits. The floors of such structure[s] and all hallways, stairways, corridors, balconies and galleries therein or thereto shall be capable of sustaining a live load of one hundred pounds per square foot, with a safety factor of five. All supports for floors or other parts of such structures shall be fully capable of sustaining the aggregate loads and pressures above provided for in addition to any rythmical or vibrating motion which may be caused in the use of such structure. The roof or covering of such building shall be capable of sustaining a live load of thirty pounds of vertical pressure and a horizontal wind pressure of forty pounds per square foot, with a safety factor of five. When walls supporting floors are of common brick work, the minimum of thickness and the maximum of height, supposing the length to equal the height, shall be,

where no openings occur, 9-inch wall, 10 feet, used inside only; 13-inch wall, 20 feet; 17-inch wall, 30 feet; 21-inch wall, 40 feet; 26-inch wall, 50 feet; 30-inch wall, 60 feet; but when thinner walls stand upon thicker walls the total height shall not exceed the one above given. Walls of hard brick, laid in cement, may be increased fifty per cent. above these dimensions. When walls between supports are of greater or less length than the height, the length may be increased two feet for each foot the height is reduced; or reduced one-half foot for each foot the height is increased, from the dimensions given in this section. When there are buttresses or pilasters extending to the foundations and projecting from the wall, the thickness of the wall may be reduced by one-half the depth of such projections, provided they occupy at least one-tenth of the surface of the wall, and the thickness of the intervening walls, considered separately, shall not be less than what has been given in this section; provided, however, that when any wall is strengthened by firm anchoring of girders, floors or roofs, such anchors not being more than twelve times the thickness of the wall from each other, either horizontally or vertically, the surface of such wall may be doubled. The thickness of level-bedded stone walls to be the same as brick. For rough stone not in courses, add twenty-five per cent. to the thickness for brick. Where openings occur, thicken the walls by their ratio of surface. All piers, pillars and columns shall be capable of sustaining the aggregated live load given and the weight of the building. All arches must contain the line of pressure within the middle one-third of the voussoirs. The greatest pressure allowed per square foot of good brick work shall be five tons; for work of hard brick, laid in first-class cement, ten tons; for unbedded sandstone masonry, four tons; for second-class masonry, eight tons; for first-class masonry, twelve tons. Piers, columns, pillars and all marble, granite and limestone work, not over twenty per cent. of the crushing weight. Every such building, place or room, when above the second floor, shall be provided with at least one fire-escape, which shall be so placed as to be easily accessible, so marked that it may be generally understood, so constructed as to lead directly to the open air, and so designed as not to be dangerous for women and children, and shall be sufficiently enclosed to protect persons thereon from fire below, i. e., it shall be placed against a dead wall and be enclosed on three sides, and in buildings where two or more assemblages occur, as in school-houses, each room above the second floor must have an exit leading to a fire-escape. No fire-escapes shall be less than twenty-four inches in clear width, with an additional one-fourth inch in width for each person (over fifty) to be accommodated thereby. The ventilating system or machinery shall be capable of changing the air in such room every thirty minutes; and all lavatories and water-closet places shall have double the above given capacity for ventilation; and all conveniences used in such buildings shall have soil and waste-pipes fully ventilated to the outside air. The warming and lighting apparatus shall be arranged and constructed so as to be safe against explosion or fire. All smoke flues or pipes, unless lined with terra cotta or other fire-proof material of permanent character, shall not be nearer than eight inches to any combustible material, and not nearer than four inches in any case, nor shall any smoke flue, pipe or chamber of metal being or passing under wood-work, be nearer thereto than twice the diameter of such pipe, flue or chamber, unless protected with suitable fire-proof guard with open space above. Every warm air flue of metal shall be at least one-half inch from all wood-work, and also completely covered with asbestos or other fire-proof wrapping, with circulation of air between it and the wood, and no wood shall

be nearer than four inches to any such flue in brick work. (7755-11; 86 v. 381.)

SEC. 197. [Exceptions as to application of this act.] This act shall not apply to cities of the first class where the construction of buildings is regulated by statute under the direction of a building inspector; nor shall it be construed so as to interfere with existing laws relating to the inspection of buildings, but no certificate as now provided by law shall be issued for buildings hereafter erected, or alterations hereafter made (except in such cities of the first class), unless they conform to the requirements of this act. (7755-12; 86 v. 383.)

SEC. 198. [Penalty for violation of this act.] Any person who violates any of the requirements of this act shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be fined in any sum not less than \$100 nor more than \$1,000, or be imprisoned in the county jail not less than ten nor more than sixty days, or both, at the discretion of the court, and shall be also liable to any person injured by reason of his violation of the requirements of this act, and shall be also liable for criminal prosecution for loss of life. (7755-13; 86 v. 383.)

SEC. 199. [Prosecuting attorney to enforce provisions of act.] It shall be the duty of prosecuting attorneys to see that this law is enforced in their respective counties, and for each conviction of violation thereof they shall be entitled to a fee of twenty-five dollars, and such other sums as may be allowed by the board of county commissioners. (7755-14; 86 v. 383.)

SEC. 200. [Examination of public hall, etc., as to safety in case of fire.] On application of the owner or person having control of an opera house, hall, theater, church, school-house, or other building except buildings where secret societies are held, used for public assemblages, in any municipal corporation, the mayor, civil engineer, and chief engineer of the fire department, or if such corporation has no such engineer, the mayor and two members of council, shall carefully make a joint examination of such opera house, hall, theater, church, school-house, or other building, to ascertain the means provided thereat and therein for the speedy and safe egress of the persons that may at any time be there assembled, and the means provided for extinguishing a fire at or in such place: provided, that when the assembly rooms of such church are situated upon the ground floor, with a sufficient number of low windows, in the opinion of the commission above provided for, to secure safe and easy means of escape in case of alarm, they shall grant the certificate mentioned in the next following section. (2568; 62 v. 139.)

SEC. 201. [Certificate in such case.] If, upon such examination, it is found that such opera house, hall, theater, church, school-house, or other building is abundantly provided with means for speedy and safe egress of the persons who may at any time be there assembled, and, if above the first floor, that it is provided therein with water or other equally efficient agency, and proper means to apply it, so that any fire which may occur at such place can be immediately extinguished, the mayor and persons so acting with him, or a majority of the three, shall issue to such owner or person having control as aforesaid, a certificate of the fact, which shall continue in force one year, unless sooner revoked by council. (2569; 62 v. 139.)

SEC. 202. [Re-examination in case of change in building.] If any change or alteration is made in such building, the owner or person having charge of it shall notify the mayor of the fact, who shall cause to be made

a re-examination in all respects like that provided for in the last section, and if upon such examination such owner, or person having control, is entitled to such certificate as is mentioned in the last section, it shall be issued to him, with like effect. (2570; 62 v. 139.)

SEC. 203. [Appeal of owner or person in control from refusal to issue certificate.] If any owner or person having control of such place, as aforesaid, shall feel himself aggrieved by the refusal of such officers to issue any such certificate, he may appeal from the decision to the council, which shall appoint three disinterested persons to examine the premises, any two of whom may issue the certificates provided for in sections *two thousand and five hundred and sixty-nine and two thousand five hundred and seventy.* (2571; 62 v. 139.)

SEC. 204. [Penalties against owner or person having control.] Whoever being the owner or having control as an officer, agent or otherwise, of any opera house, hall, theater, church, school-house, or other place, for [the] public assemblage of people, in a municipal corporation, permits it to be used when any door affording exit therefrom is locked or barred, or opens inwardly; when the place is not provided with ample means for the safe and speedy egress of the persons who may be so assembled; when, if it is on another than the first floor, sufficient water and proper means to apply it, or other efficient means, are not provided in such place to extinguish any fire which may occur thereat; or when the certificate provided for in section 2569 or section 2570, as the case may be, has not been issued, or is not in full force, shall, for each day or night he permits such place to be so used or occupied, forfeit and pay any sum not more than one thousand dollars, [nor] less than fifty dollars, to be recovered, with costs, in [a] civil action, in the name and for the use of the municipal corporation; and it shall be the duty of the mayor, with the aid of the police, to see that the provisions of this section are strictly enforced. (2572; 62 v. 139)

SEC. 205. [Public halls: inspection may be dispensed with in certain cases; refusal of certificate.] Whenever any structure referred to in section 2572 shall have been inspected by the state inspector of shops and factories, and such inspector shall have issued to the owner thereof or his agent, a certificate that such structure is properly arranged for the safe and speedy egress of persons who may be assembled therein, and also properly provided with means for the extinguishment of fire at or in such structure as now required by law, then such certificate shall dispense with all other inspections and certificates required by law in regard to the safety of such structures for public assemblages, and in case such inspector shall find on inspection that such structure is not properly arranged for the safe and speedy egress of persons who may be there assembled, or not properly provided with means for the extinguishment of fire at or in such structure as now required by law, he shall notify the owner, officer or agent in charge of such structure and the mayor of the municipal corporation wherein the same is located, in writing, of the fact that he refuses such certificate, specifying his reasons and the alterations, additions and appliances necessary to be made and furnished before a certificate will be issued; and no certificate required by law in regard to the safety of such structure shall be issued by the mayor, or any officer or person under any provision of the law till the requirements of the foregoing notice are complied with to the satisfaction of the state inspector. (1891, March 6: 2572a; 88 v. 85.)

SEC. 206. [Public halls, etc., when inspection to be made.] It shall be the duty of the state inspector of workshops and factories, or his

assistants, to make inspections of such building as is provided for in sections 2568 and 2569 of the Revised Statutes of Ohio as often as he may deem necessary, or upon the written demand of the agent, or owner of such structure, or upon the written request of five or more citizens of the municipal corporation where such structure is located. (1890, April 24: 2572b; 87 v. 279.)

SEC. 207. [Duties of factory-men, hotel-keepers, etc., as to fire escapes.] It shall be the duty of any owner or agent for owner of any factory, workshop, tenement house, inn, or public house, if such factory, workshop, tenement house, inn, or public house be more than two stories high, to provide [a] convenient exit from the different upper stories of said building, which shall be easily accessible in case of fire, and any owner or person having control of any such inn or public house where travelers or boarders are lodged in any story above the second story of the building, shall also provide a good rope or other life line for each sleeping-room for guests in such stories. (2573; 80 v. 187.)

Where the owner of the factory is one person, and the owner of the building in which the factory is located is another, the former is the person on whom the duty named in the statute is enjoined: *Lee v. Smith*, 42 O. S. 458. *Owen*, J. dissented.

SEC. 208. [Duty of mayor to require such escapes; penalty for failure to comply.] It shall be the duty of the mayor of each city or village to require the owner or agent for owner of any factory, workshop, tenement house, or inn or public house, within the meaning of the next preceding section, to comply with the requirements of said section within sixty days from the serving of a notice by the mayor so to do, unless such owner or agent for owner shall have previously complied with the requirements of said preceding section, and if any such owner or agent of owner neglects or refuses to comply with the requirements of the next preceding section within the time specified in said notice, he shall forfeit not less than fifty nor more than three hundred dollars for each and every month he so fails to comply therewith, the amounts so forfeited to be recovered in the name of and for the use of such city or village in an action in the police court or other competent tribunal; such owner or agent for owner may also be held for civil damages to the party injured. (2574; 80 v. 187.)

SEC. 209. [Mayor etc., to examine building once a year; compensation.] It shall be the duty of the mayor of such city or village, personally, or by the marshal or head of police of such city or village, or other proper person whom the mayor may appoint acting under the direction of the mayor, as inspectors of fire-escapes to carefully examine such factories, workshops, tenement houses, inns or public houses once in each year, and report all violations of the provisions of sections 2573 and 2574 to the council of such city or village, when proceedings shall be commenced, without unnecessary delay, against the person so offending, and said mayor, marshal, or head of police, or person so appointed by the mayor to act as inspector of fire-escapes shall be entitled to receive for said notices and said examination such fees as the council may by ordinance provide. (2575; 80 v. 188.)

SEC. 210. [Penalty for using hall, theater, etc., without certificate; unlawful to obstruct aisles.] Whoever being the owner of a hall, theater, opera-house, church or school-house, having the control thereof, individually or by virtue of his office as agent of any society or corporation, permits the same to be used for the purpose of public assemblies or schools

without having the certificate required by law that the same is provided with the means of speedy and safe ingress and egress, shall be fined not more than one thousand dollars for each and every such offense; nor shall it be lawful for any owner, lessee or proprietor of a hall, theater or opera-house to block up the aisles and hall-ways therein by placing chairs, stools or permitting them to be occupied by persons standing therein, or by any obstructions whatever to the danger of those occupying sittings therein, by cutting off an escape, and easy egress therefrom, under the penalty as above enumerated in this section for not providing means for escape in case of fire or other casualties. (7010; 80 v. 28.)

SEC. 211. [Certain boarding-schools and colleges to be furnished with fire escapes.] Whoever being the owner of a building more than two stories in height used as a boarding-school or college or having control thereof, individually or by virtue of his office as agent of any society or corporation, permits the same to be used for the purposes of a boarding-school without having provided the same with convenient and safe means of ingress and egress in case of fire, shall be fined not more than one thousand dollars for each and every such offense. (1891, March 16: 88 v. 103.)

DIVISION X.

Relating to Railroads and Railroad Employes

COMMISSIONER OF RAILROADS.

SEC. 212. [Duty of commissioner to examine tracks, bridges, etc., supposed to be dangerous; shall prescribe rate of speed for passing over same, or wholly stop the trains from passing over same; penalties.] When the commissioner has reasonable grounds to believe, either on complaint or otherwise, that any of the tracks, bridges, or other structures of any railroad in this state are in a condition which renders them, or any of them, dangerous, or unfit for the transportation of passengers, he shall forthwith inspect and examine the same; and if, on such examination by himself or his agent, he is of opinion that any of such tracks, bridges, or other structures are unfit for the transportation of passengers with safety, he shall immediately give to the superintendent, or other executive officer of the company operating such road, notice of the condition thereof, and of the repairs or reconstruction necessary to place the same in a safe condition; and he may also prescribe the rate of speed for trains passing over such dangerous or defective track, bridge, or other structure, until the repairs or reconstructions required are made, and the time within which such repairs or reconstructions must be made; or if, in his opinion, it is needful and proper,

he may forbid the running of passenger trains over such defective track, bridge or other structure; and if a superintendent or other executive officer receiving such notice and order neglects for two days after receiving the same to direct the proper subordinate officers to run the passenger trains over such defective track, bridge, or other structure, at a speed not greater than that so prescribed, or if the running of passenger trains is so forbidden, then to stop running passenger trains over the same; or if any engineer, conductor, or other employe knowingly disobeys such order, every superintendent, officer, engineer, conductor, or employe, so offending, shall be fined in any sum not exceeding five hundred dollars, or imprisoned in the jail for any period not exceeding one year, or both, at the discretion of the court; and the company operating such road, if it neglects or without good cause fails to make the repairs or reconstruction prescribed by the commissioner within the time by him limited, shall for each day that such repair or reconstruction is delayed beyond the time precribed, forfeit and pay to the state the sum of one hundred dollars. (247; 64 v. 111.)

SEC. 213. [**When railroad companies must erect gates at crossings.**] When, in the opinion of the commissioner of railroads, the public safety requires that a gate or gates be erected and maintained at any place where a public road or street is crossed at the same level by any railroad, and which crossing has been declared by said commissioner to be a dangerous one, or that a flagman be stationed and maintained at such dangerous crossing, he shall give to the superintendent, manager or other officer in charge of such railroad, a written notice that the same is required, and such company, person or corporation owning or operating such railroad shall erect or station the same within such time thereafter as said commissioner shall prescribe. Any company, person or corporation neglecting or refusing to erect or maintain such gate or gates, or to maintain such flagman, when so required as aforesaid, shall forfeit and pay to the state, for every such neglect or refusal, the sum of one hundred dollars, and the further sum of ten dollars for every day while such neglect or refusal shall continue. (247a; 86 v. 367.)

SEC. 214. [**Must be approved by commissioner of railroads; penalty for violation of this act.**] All gates which by the provisions of this act are under the direction of the commissioner of railroads, shall be built in such manner, and within such time, and of such material as shall be approved by the commissioner of railroads, and shall be located on the highway or street, on one or both sides of the railroad track or tracks, as the commissioner may deem the public safety to require, and shall be so constructed as, when closed, to obstruct and prevent any passage across such railroad or railroads from the side on which such gate may be located. There shall be a person in charge of every such gate, and it shall be his duty to close the same at the approach of every train of cars, or of a locomotive, and to keep it open at all other times. For every neglect of such duty, such person upon conviction thereof, shall pay the sum of twenty-five dollars. When more than one railroad crosses a public highway or street at such dangerous crossing, the expense incurred in the erection and maintenance of the gates provided for in this section, and of the necessary gate-keepers, or of a flagman, shall be shared equally by the railroad companies alongside whose tracks the gates shall be located. (247b; 86 v. 367.)

SEC. 215. [**Must erect sign boards at road crossings.**] Each company shall erect, at all points where its road crosses a public road, at a sufficient elevation from such public road to admit of the free passage of vehicles

of every kind, a sign, with large and distinct letters placed thereon, to give notice of the proximity of the railroad, and warn persons to be on the lookout for the locomotive; and a company which neglects or refuses to comply with this provision shall be liable in damages for all injuries which occur to persons or property from such neglect or refusal. (3323; 50 v. 274.)

HEATING, LIGHTING, ETC., OF PASSENGER CARS.

SEC. 216. [**Movable bridge between passenger cars required.**] Every company conveying passengers shall provide the passenger cars in its trains with a flexible or movable bridge or apron, of the full width of the opening between the railings attached to the platforms of such cars, with side boards or net-work of strap iron or large wire, or other suitable material, at each side of the bridge or apron, of at least equal height with the ordinary railings upon the platforms, or some other apparatus or arrangement equally efficient to enable passengers to pass from car to car with safety. (3347; 68 v. 35.)

SEC. 217. [**Penalties for violation of preceding section.**] A company which fails to comply with the provisions of the preceding section shall be subject to a penalty of one hundred dollars for each and every day of such failure, to be recovered in a civil action, in the name of the state, and paid into the state treasury. (3248; 68 v. 35.)

SEC. 218. [**Commissioner of railroads must enforce certain sections.**] The commissioner of railroads and telegraphs shall see that the provisions of sections 3347 and 3348 are enforced. (3350; 68 v. 35.)

SEC. 219. [**Prescribing heating apparatus for railroad cars.**] Each railroad company in this state shall, when necessary to heat any of its cars for carrying passengers, mail, baggage or express matter, do so by a stove or heater so constructed and protected as to most effectually guard the passengers against the danger by fire, in case of accident by collision, or the cars being overturned or thrown from the track, and it shall be unlawful for any such company to permit any other person or corporation to use cars carrying passengers, mail, baggage or express matter over its road unless the heating apparatus thereof shall conform to the requirements of this section. (3351; 77 v. 202.)

SEC. 220. [**How passenger cars to be lighted.**] No passenger cars on any railroad shall be lighted by naphtha, or any illuminating oil fluid made in part from naphtha, or wholly or in part from coal or petroleum, or other substance or material which will ignite at a temperature of less than three hundred degrees Fahrenheit; and the commissioner of railroads and telegraphs, by himself or agent, may, at any time, enter the cars running on any railroad and take from any lamp therein samples of the oil found there, for the purpose of testing the same, and if it proves of a lower grade than is required by the provisions of this section, he shall bring suit for the penalty provided in section 3354. (3353; 74 v. 207.)

SEC. 221. [**Penalties for violating certain sections.**] Any railroad company refusing or neglecting to comply with the provisions of section 3351, shall be liable to a penalty of not less than one hundred, nor over five hundred dollars, to be recovered in a civil action in any court of record in any county through which such road shall pass, in the name of the state of Ohio for the benefit of the common schools of the state, to be prosecuted by the prosecuting attorney of the proper county, at the instance of the

prosecuting attorney or at the instance of the railroad commissioner, as provided by law (sec. 263, Rev. St.) in other cases for the recovery of penalties and forfeitures against railroad companies, after due notice given by such railroad commissioner to the president or managing officer of such delinquent railroad company, and its neglect thereafter for a period of thirty days to comply with the provisions of said section; the prosecuting attorney to receive twenty-five (25) per cent. of all fines and costs collected under the provisions of this act. (3354; 77 v. 202.)

RAILROAD EMPLOYEES.

SEC. 222. [Employment of color-blind persons by railroad companies forbidden, except; examination.] No railroad company shall hereafter contract to employ any person in a position which requires him to distinguish form or color signals, unless such person within two years next preceding has been examined for color-blindness in the distinct colors in actual use by such railroad company by some competent person employed and paid by the railroad company, and has received a certificate that he is not disqualified for such position by color-blindness in the colors used by a railroad company. Every railroad company shall require such employe to be re-examined at least once within every two years at the expense of the railroad company; provided, that nothing in this section shall prevent any railroad company from continuing in its employment any employe having defective sight, in all cases where such defective sight can be fully remedied by the use of glasses, or by other means, satisfactory to the person making such examinations. (8516-29; 85 v. 58.)

SEC. 223. [Penalty.] A railroad company shall be liable to a fine of one hundred dollars for each violation of the preceding section. (8516-30; 85 v. 58.)

SEC. 224. [Requirements as to qualifications of railroad conductors and locomotive engineers.] It shall be unlawful for any railroad company or corporation, running or operating a steam railroad in the state of Ohio, thirty miles in length or more, and the same having, been run and operated for three years or more, to employ any person in the capacity of conductor of passenger train or trains, unless such person has had at least two years' experience in the position of conductor, engineer or trainman of either passenger, freight, or construction train, within six years next preceding the time of such employment. It shall also be unlawful for any such railroad company or corporation, to employ any person in the capacity of freight conductor, or conductor of a construction train, unless such person has had at least two years' previous experience as conductor, engineer or trainmen, for a term of two years, or has been employed as a brakeman for at least two years on either passenger, freight or construction trains within five years next preceding the time of such employment. It shall be unlawful for any such railroad company to employ any person in the capacity of locomotive engineer unless such person has had at least three years' experience as locomotive fireman. But nothing in this act shall be so construed as to prevent any such railroad company or corporation from retaining conductors, engineer or trainman, in its employ at the time of its passage. (1891, April 17; 88 v. 320.)

SEC. 225. [Penalties.] Any railroad company or corporation knowingly violating the provisions of this act, shall be fined, for the first

offense, not less than five hundred nor more than one thousand dollars, and for any subsequent offense shall be fined not less than one thousand nor more than fifteen hundred dollars, which shall be recovered in a civil action in the name of the state. (1891, April 17; 88 v. 320.)

SEC. 226. [Duty of railroad commissioner.] It is hereby made the duty of the railroad commissioner of this state to enforce the provisions of this act. (1891, April 17; 88 v. 321.)

SEC. 227. Railroad companies shall not employ locomotive engineers addicted to drink; penalty.] It shall be unlawful for any person, company or corporation operating a railroad in whole or in part in this state, knowingly to suffer or permit, either directly, or by, or through, any representative, any person to run or operate in any capacity a railroad locomotive on any part of his, their or its road in this state who is intoxicated, or in the habit of becoming intoxicated or to knowingly continue the employment of any person in any such capacity, after he becomes or is intoxicated, while in charge of such locomotive, and for every violation of this section, such company, person or corporation operating such road, shall forfeit and pay to the state of Ohio two hundred dollars to be recovered in the name of the state in a civil action to be prosecuted in any county through which the road runs, by the prosecuting attorney thereof, and he shall be entitled to twenty-five per cent. of the recovery and the balance shall be paid into the county treasury.

SEC. 228. [Hours of services of certain railway employees limited.] That section 1 of an act entitled an act to provide against accidents on railroads, and to limit the hours of service, be amended so as to read as follows: That any company operating a railroad over thirty miles in length, in whole or in part, within the state, shall not permit or require any conductor, engineer, fireman or brakeman on any train, or any telegraph operator, who have worked in their respective capacities for twenty-four consecutive hours, to again be required to go on duty, or perform any work, until they have had at least eight hours rest. Ten hours shall constitute a day's work, and for every hour that any conductor, fireman, engineer, brakeman, or any trainman, or any telegraph operator of any company, who works under directions of a superior, or at the request of the company, shall be paid for said extra services in addition to his per diem. (1891, April 23; 88 v. 344.)

SEC. 229. [Penalty for violation of foregoing section.] Any company which violates, or permits to be violated any of the provisions of the preceding section, or any officer, agent or employe who violates, or permits to be violated any of the provisions of the preceding section shall be fined not less than one hundred dollars, nor more than one hundred and fifty dollars. (1890, March 26; 87 v. 113.)

SEC. 230 [For the protection of railroad employes; use of defective machinery prima facie evidence of neglect, etc.] That it shall be unlawful for any railroad or railway corporation or company owning and operating, or operating, or that may hereafter own or operate a railroad in whole or in part in this state, to adopt or promulgate any rule or regulation for the government of its servants or employes, or make or enter into any contract or agreement with any person engaged in or about to engage in its service, in which, or by the terms of which, such employe in any manner, directly or indirectly, promises or agrees to hold such corporation or company harmless, on account of any injury he may receive by reason of any accident to, breakage, defect or insufficiency in the cars

or machinery and attachments thereto belonging, upon any cars so owned and operated, or being run and operated by such corporation, or company being defective, and any such rule, regulation, contract or agreement shall be of no effect. It shall be unlawful for any corporation to compel or require directly or indirectly an employe to join any company association whatsoever, or to withhold any part of an employe's wages or his salary for the payment of dues or assessments in any society or organization whatsoever, or demand or require either as a condition precedent to securing employment or being employed, and said railroad or railway company shall not discharge any employe because he refuses or neglects to become a member of any society or organization. And if any employe is discharged, he may, at any time within ten days after receiving a notice of his discharge demand the reason of said discharge, and said railway or railroad company thereupon shall furnish said reason to said discharged employe in writing. And no railroad company, insurance society or association, or other person shall demand, accept, require, or enter into any contract, agreement, stipulation with any person about to enter, or in the employ of any railroad company whereby such person stipulates or agrees to surrender or waive any right to damages against any railroad company, thereafter arising for personal injury or death, or whereby he agrees to surrender or waive in case he asserts the same, any other right whatsoever, and all such stipulation and agreements shall be void, and every corporation, association or person violating or aiding or abetting in the violation of this section shall, for each offense forfeit and pay to the person wronged or deprived of his rights hereunder the sum not less than fifty dollars (\$50) nor more than five hundred dollars (\$500) to be recovered in a civil action.

SECTION 2. It shall be unlawful for any such corporation to knowingly or negligently use or operate any car or locomotive that is defective, or any car or locomotive upon which the machinery or attachments thereto belonging are in any manner defective. If the employe of any such corporation shall receive any injury by reason of any defect in any car or locomotive, or the machinery or attachments thereto belonging, owned and operated, or being run and operated by such corporation, such corporation shall be deemed to have had knowledge of such defect before and at the time such injury is so sustained, and when the fact of such defect shall be made to appear in the trial of any action in the courts of this state, brought by such employe or his legal representatives, against any railroad corporation for damages, on account of such injuries so received, the same shall be prima facie evidence of negligence on the part of such corporation. (1890, April 2; 87 v. 149.)

SEC. 231. [Superior officer and fellow servant defined.] That in all actions against the railroad company for personal injury to, or death resulting from personal injury, of any person, while in the employe of such company, arising from the negligence of such company, or any of its officers or employes, it shall be held in addition to the liability now existing by law, that every person in the employ of such company, actually having power or authority to direct or control any other employe of such company, is not the fellow servant, but superior of such other employe, also that every person in the employ of such company having charge or control of employes in any separate branch or department, shall be held to be the superior and not fellow servant of employes in any other branch or department who have no power to direct or control in the branch or department in which they are employed. (1890, April 2; 87 v. 150.)

SEC. 232. [Blocking of railway frogs, guard rails, etc.] Every

railroad corporation operating a railroad or part of a railroad in this state shall, before the first day of October, in the year eighteen hundred and eighty-eight, adjust, fill or block the frogs, switches and guard rails on its track, with the exception of guard rails on bridges, so as to prevent the feet of its employes from being caught therein. The work shall be done to the satisfaction of the railroad commissioner. (8516-31; 85 v. 105.)

SEC. 233. [**Penalty for failure so to do.**] Any railroad corporation failing to comply with the provisions of this act, shall be punished by a fine of not less than one hundred dollars. nor more than one thousand dollars. (8516-32; 85 v. 105.)

BRIDGES: SWITCHING.

SEC. 234. [**Bridges over railroad crossings.**] It shall be unlawful for any person, company or corporation owning, or operating any railroad, crossing, or that may hereafter cross, over and above any street, less than seventy feet in width, in any city in this state, at an elevation above such street, sufficient to permit persons to pass and repass along such street beneath such railroad crossing, to place or cause to be placed, or to suffer or permit to be or remain in such street, beneath such railroad crossing or bridge, any pier or other stay or support for such crossing or bridge, or to suffer or permit any such railroad crossing or bridge to be or remain in such condition, that any iron, coal or other hard substance, or any fluid or noisome matter, may fall or drop from or through any such crossing or bridge, upon persons traveling or passing beneath the same; and any such person, company or corporation owning or operating any such railroad, failing to comply with the requirements of, or violating any of the provisions of this section, shall, for each and every day during the continuance of such failure or violation, and on account thereof, forfeit and pay to such city the sum of one hundred dollars, which may be recovered in a civil action, in the name of such city, against the owner or operator of such railroad, or both, as the city may elect, and thereafter like recovery may be had in like manner, for subsequent failures and violations aforesaid. (8516-43; 86 v. 197.)

SEC. 235. [**Council may prohibit switching, obstructing, etc.**] The city council of any city may prohibit the switching of freight engines, trains, or cars, over or on said crossing or bridge, the sounding of locomotive steam whistles on or near the same, and the standing or stopping of any railroad engine over or on the same, and may, by ordinance, constitute the same an offense, and provide for the punishment of any person committing such offense. (8516-44; 86 v. 197.)

STREET RAILROADS.

SEC. 236. [**Intersecting street railroads: repair of crossings, stopping of cars at crossing.**] Where the tracks of two street railroads cross each other or in any way connect at a common grade, when one or both such street railroads use other than horse power for propelling their street-cars, the crossings shall be made and kept in repair at the joint expense of the companies owning the tracks, and all such cars used on said street railroads shall come to a full stop, not nearer than ten feet nor further than fifty feet from the crossing, and shall not cross until the way is clear; and when two or more cars approach the crossing at the same time the

car or cars on the road first built shall have precedence. (1891, May 4: 88 v. 581.)

SEC. 237. [**Street-cars must come to full stop when approaching intersecting steam railway, etc.**] That whenever the tracks of any street railroads in this state cross the tracks of any steam railway at grade, the street railway company operating said line of cars shall cause their street-cars to come to a full stop not nearer than ten feet nor further than fifty feet from the crossing, and before proceeding to cross said steam railway tracks, shall cause some person in their employ to go ahead of said car or cars and ascertain if the way is clear and free from danger for the passage of said street-cars, and said street railroad cars shall not proceed to cross until signaled so to do by such person so employed as aforesaid, or said way is clear for their passage over said tracks. (1891, May 4: 88 v. 582.)

SEC. 238. [**Penalties.**] Every person in charge of any street-car or cars who willfully fails to comply with the provisions of this act, and fails to bring said car or cars which he has in charge to a full stop, or causes the same before the way is clear, or signaled so to do to cross said steam railroad tracks, shall be personally liable to any person injured by reason of such failure as aforesaid, to a penalty of one hundred dollars, to be recovered by civil action at the suit of the state of Ohio in the court of common pleas of any county wherein such crossing or connection is, and the company in whose employ such person having charge of said car or cars is, as well as the person himself shall be liable in damages to any person or persons injured in person or property [having charge of such car or cars] as aforesaid. (1891, May 4: 88 v. 582.)

DIVISION XI.

Relating to Sewerage, Drainage, etc.

SEC. 239. In addition to the powers specifically granted in this title, and subject to the exceptions and limitations in other parts of it, cities and villages shall have the general powers enumerated in this section, and the council may provide by ordinance for the exercise and enforcement of the same.

(a) 21. [**Sewers.**] To open, construct, and keep in repair sewers, drains, and ditches.

(b.) 31. [**Water.**] To provide for a supply of water, by the construction of wells, pumps, cisterns, aqueducts, water-pipes, reservoirs, and water works, and for the protection thereof, and to prevent unnecessary waste of water, and the pollution thereof. (1692; 86 v. 357.)

SEC. 240. When county commissioners may construct ditches or improve channel of river or creek.] The commissioners of any county at any regular or called session may, in the manner provided in this chapter, when the same is necessary to drain any lots, lands, public or corporate road or railroad, and will be conducive to public health, convenience or welfare, cause to be located, and constructed, straightened, widened, altered, deepened, boxed or tiled, any ditch, drain or water course, or box or tile any portion thereof or cause the channel of all or any part of any river, creek or run, within such county to be improved by straightening, widening, deepening or changing the same, or by removing from adjacent lands any timber, brush, trees or other substance liable to form obstructions therein. (4447; 82 v. 89.)

SEC. 241. [Township trustees may establish ditches.] The trustees of any township may, whenever, in their opinion, the same will be conducive to the public health, convenience or welfare, cause to be established, located and constructed, as hereinafter provided, any ditch within such township, and for that purpose may cross a railroad, turnpike road, or do any other thing necessary or proper to promote said purpose. (4511; 78 v. 204.)

SEC. 242. [Commissioners may remove obstructions as a sanitary measure.] The county commissioners of any county may, whenever in their opinion the same will be conducive to the public health, convenience, or welfare, upon petition of the owner of any land adjoining or adjacent to any stream of living water, remove, or cause to be removed any drift, timber, or other obstructions except mill-dams, water-works, or flood-gates, that may hinder the free passage of water in the natural channel of such stream. (4567; 74 v. 22.)

It is the public health, convenience or welfare of the community to be affected by the proposed ditch, and not of the public at large, that is to be regarded in the construction of a ditch. Hence, if it appears that the proposed ditch will be "conducive to the public health, convenience and welfare of the neighborhood" through which it will pass, the commissioners are authorized to construct the same. *Chesbough v. Commissioners*, 37 O. S. 508.

SEC. 243. [County commissioners may remove certain mill-dams as a sanitary measure.] The county commissioners of any county may, whenever in their opinion the same will be conducive to the public health, convenience or welfare, upon petition of the owners of any lands adjoining or adjacent to any stream of living water, remove or cause to be removed any mill-dam or mill dams that may hinder the free passage of water in the natural channel of such stream. (4567a; 80 v. 200.)

SEC. 244. [If conducive to public health, commissioners may purchase and remove mill-dams; estimating cost of removing same; cost of to be apportioned according to benefits; when right to compensation barred; etc.] If the commissioners find that the bond has been filed and notice given, they shall proceed to hear and determine the petition, and shall proceed to view the premises along the proposed improvement and the lands of the petitioners affected by said mill-dam or mill-dams, and if they find that such improvement and removal of said mill-dam or mill-dams will be conducive to the public health, convenience or welfare, they shall at once proceed to negotiate with and purchase of the owner or owners of such mill-dam or mill-dams, all rights, title and interest they may have to or in the same, and all franchises pertaining thereto, receiv-

ing thereby the absolute right to remove the same for the free passage of water in the channel of such stream. Said purchases to be made upon such terms and for such price as may seem reasonable and just to said commissioners; at the same time said commissioners shall take with them a competent surveyer or engineer, who shall make a careful estimate of the necessary cost of removing said mill-dam or mill-dams for the free passage of water in the channel of such stream. Said commissioners shall fix a day for further hearing, and order that due notice be served, in writing, by the principal petitioners upon each and every one of said petitioners, of the time and place of said hearing. If, on said hearing, it appears to the commissioners that the notice herein provided for has not been given, the commissioners shall adjourn to some future time not exceeding twenty days, and shall order such notice to be given. On the day fixed by the commissioners for final hearing, they shall meet at the time and place appointed, and shall then and there state and make known to the petitioners the amount asked by the owner or owners of such mill-dam or mill-dams of all their right, title and interest to and in the same and the franchises pertaining thereto, and for the right to remove the same so that the waters of such stream shall pass through without hindrance; and the necessary cost of removing said mill-dam or mill-dams, as estimated by said engineer or surveyor, together with all other taxable costs of the proceedings. And if, upon such statement, no objections be made thereto, by said petitioners, or either of them, said commissioners shall make a record thereof. Said commissioners shall then apportion to each of said petitioners, in a fair and equitable manner, according to the benefits to be derived therefrom, as nearly as can be done, all costs of the proceedings, as in county ditch cases, the amount asked by the owner or owners of said mill-dam or mill-dams, and agreed upon as above, and the amount of costs necessary to the removal of said mill-dam or mill-dams, as reported by the surveyer or engineer. (But in any case, where a mill has become useless or has been destroyed, and has so remained for more than ten years, without any attempt to repair or rebuild the same, the mill-dam and water-rights and privileges belonging to the same shall be deemed abandoned and the right thereto as against the public health, convenience and welfare, under this act, shall cease and be barred; and the commissioners may, under this act, without bargain or compensation, cause such mill-dam to be removed and the water-course upon which it is located, cleaned out and improved. When an apportionment has been made, as hereinbefore stated.) The commissioners shall then order the said amounts to be placed upon the tax duplicates, against the real estate of said petitioners benefited by the removal of such dam, and to be collected within the time and to meet the payments as far as practicable, in conformity with the provisions of the county ditch law, agreed upon between said commissioners and said mill-dam owner or owners, adding to the first year's assessment the taxable costs of the proceedings, and the estimated costs of removing said mill-dam or mill-dams. Said assessment shall be collected the same as other assessments against real estate, and paid into the treasury of the county wherein said petitioners reside, and wherein said mill-dam or mill-dams are situated, and shall be paid out by the county treasurer on the warrant of the county auditor, who shall issue his warrants in accordance with the records and orders of the county commissioners. The surveyor or engineer appointed by the commissioners, shall sell at public outcry the work of removing such mill-dam or mill-dams, and supervise the same, as stated in sections 4475, 4476, 4477 and 4478 of the Revised Statutes of Ohio. From the action of said commissioners in apportioning the costs,

expenses and assessments provided herein, there shall be no appeal. (4567c; 81 v. 135)

SEC. 245. [Ditches must be provided by railroads.] There shall be constructed and kept open, along the road-bed of every railroad, except where the road extends through or by swamp land, by the company or person operating the road, ditches or drains of sufficient depth, width, and grade to conduct to some proper outlet the water which accumulates along the sides of such road-bed from the construction or operation of such road. (3342; 66 v. 335.)

SEC. 246. [Probate court may order construction of levee.] The probate court of any county may, whenever found to be conducive to the public health, convenience, or welfare, cause to [be] located, established and constructed, as hereinafter provided, a levee along any stream or water-course of any kind within the county, for the protection of land from overflow. (4585; 73 v. 88.)

DIVISION XII.

Relating to Animals and Animal Diseases.

LIVE STOCK COMMISSION.

SEC. 249. [Board of live stock commissioners.] The governor shall, with the advice and consent of the senate, appoint three persons, who shall constitute a board of live stock commissioners, who shall hold their office in the order in which they are named, the first for one year, the second for two years, and the third for three years, and their successors in office shall be appointed for three years each. They shall meet as soon as practicable after their appointment, and after taking the oath of office, shall appoint from their number a president and secretary. (7468-26; 82 v. 176)

SEC. 248. [Their powers and duties.] The board of commissioners are authorized to use all proper means to prevent the spread of dangerous and fatal diseases among domestic animals, and to provide for the extirpation of such diseases; and in the event of any such contagious or infectious disease breaking out in this state, it shall be the duty of all persons owning or having in charge animals infected with the same, to immediately notify said board of commissioners, or some member thereof, of the existence of such disease, and thereupon it shall be the duty of said board, immediately to cause proper examination thereof to be made by a competent veterinarian; and if said disease shall be found to be a dangerously contagious or infectious malady, the board shall order the diseased animals, and such as have been exposed to the contagion, to be strictly quarantined in charge of such person as the board, or an authorized member thereof, shall designate, and to order any premises or farms where

such disease exists, or has recently existed, to be put in quarantine, so that no domestic animal subject to such disease, be removed from or brought to, the premises or places so quarantined; and the board shall prescribe such regulations as they may deem necessary to prevent the contagion from being communicated in any way from the premises so quarantined. (7468-27; 82 v. 176)

SEC. 249. [**Bodies of dead animals.**] The bodies of all dead animals shall be buried or burned by the owners thereof, as provided by law. (7468-28; 82 v. 176.)

CONTAGIOUS OR INFECTIOUS DISEASES OF ANIMALS.

SEC. 250. [**Bodies of animals dying from contagious diseases must be burned or buried.**] The bodies of all animals dying from contagious diseases shall be burned, or buried at least four feet below the surface of the ground by the owner thereof. Any such owner permitting such dead animals to remain unburned, or unburied, or neglecting, or refusing to comply with the provisions of this section within twenty-four hours after having knowledge of the existence of such dead animals, or after notice thereof, in writing from the trustees of the township in which such dead animals may be found, it shall be the duty of said trustees to proceed to dispose of such dead animals as provided in this section, and such owner, so neglecting or refusing shall be fined in any sum not less than five dollars, nor more than twenty dollars, together with the cost of suit, and all necessary expenses incurred by said trustees in disposing of such animals. Action to recover fines, costs, and expenses as herein provided, shall be brought upon complaint of said trustees before any justice of the peace, in the township in which such owner resides. Provided, that the dead bodies of such animals may be removed to a fertilizing establishment, if removed in a water-tight tank. (1891, March 24: 6923a; 88 v. 188.)

SEC. 251. [**Act to suppress dangerously contagious diseases of animals; expenses of quarantining such animals; duty of sheriffs and constables.**] That any person having in his possession or under his care, any animal which he knows or has reason to believe, is affected with a dangerously contagious or infectious disease, and does not, without unnecessary delay, make known the same to said board, or to some member thereof, or to the sheriff or constable of the proper county, to be by him communicated to said board; or any person or corporation who shall bring into this state, or sell or dispose of any animal, knowing the same to be affected as aforesaid, or any animal having been exposed to such contagion, within three months of such exposure, or shall move the animal so diseased or exposed from the quarantine to which it was ordered by the board of commissioners, or shall move any animal to or from any district in this state declared to be infected with such contagious disease, or shall bring into this state any animal of the kind diseased from any district outside of the state that may at any time be legally declared to be affected with such disease, without the consent of said board, except under such conditions as are or may be prescribed by said board, shall, upon conviction of either of the aforesaid offenses, be fined in any sum not exceeding five hundred dollars. And all proper expense incurred in the quarantining of animals under the provisions of this act, shall be paid by the owners thereof, and if the same is refused, after demand made by order

of the commissioners, an action may be brought to recover the same with costs of suit, which action may be in the name of the state of Ohio, for the use of the board of live stock commissioners. It shall be the duty of all sheriffs and constables to execute within their several counties all lawful orders of the said commissioners. (7468-29; 84 v. 90.)

SEC. 252. [What cattle infected with disease shall not be brought into the state.] No person shall bring into the state of Ohio any cattle infected with the disease commonly known as the "Texas or Spanish fever," or pleuro-pneumonia, rhinderpest, or other contagious diseases, or any cattle liable to impart such fever or disease to other cattle; but this section shall not affect common carriers who are not the owners of cattle. Whoever violates the provisions of this section shall be liable to any person injured by bringing such cattle into the state in the amount of any loss occasioned thereby, in addition to other penalties provided by law. (4210; 75 v. 522.)

SEC. 253. [Presumptions in actions to recover damages for infection.] Whenever any Texas or Cherokee cattle, liable to impart disease, are brought into the state, and any such disease as "Texas or Spanish fever" makes its appearance within sixty days, and infects other cattle that may have been on the same highway, common, or pasture ground traveled over by such Texas or Cherokee cattle with such disease, such fact shall be deemed and taken in actions to recover damages as prima facie evidence that such Texas or Cherokee cattle were infected with the disease known as the "Texas or Spanish fever," and that they imparted such disease; and the owner of such Texas or Cherokee cattle at the time they were brought into the state, and the owner of such cattle at the time the disease makes its appearance, shall be jointly and severally liable for any damages resulting from such disease. (4211; 75 v. 522.)

SEC. 254. [Duties of carriers, and owners of stock-yards.] All railway companies and owners of steamboats used in conveying live stock and owners of stock-yards and other premises that may be occupied by such stock, shall immediately upon discovering any contagious disease among stock occupying such cars, boats, yards, or other premises, take all possible measures to prevent such diseased stock from communicating the contagion to other stock, and shall moreover cause all such cars, boats, yards, and premises to be thoroughly disinfected before the same shall be occupied by other stock. Every corporation, and company, their officers and employes, or individuals violating the provisions of this section, shall pay a penalty not exceeding five hundred dollars, to be recovered in any court of competent jurisdiction, and shall also be liable to parties injured for all damages that may be occasioned thereby. (4212.)

SEC. 255. [Selling diseased animals, allowing same to run at large or come into contact with other animals.] Whoever, being the owner, or having the charge of any animal mentioned in section 6850, knowing the same to have any infectious or contagious disease, or to have been recently exposed thereto, sells, barter, or disposes of such animal, without first disclosing to the person to whom the same is sold, bartered or disposed of, that such animal is so diseased, or has been so exposed, as aforesaid, or knowingly permits such animal to run at large, or, knowing such animal to be diseased as aforesaid, knowingly permits the same to come into contact with any such animal of another person without his knowledge or permission, shall be fined not more than five hundred nor less than twenty dollars, or imprisoned not more [than] thirty days, or both. (6855; 64 v. 207.)

SEC. 256. [Importing cattle infected with Spanish fever.] Whoever, except common carriers not the owners of cattle transported by them, brings into this state any cattle infected with the disease commonly known as the Texas or Spanish fever, or cattle liable to impart such fever to other cattle, shall be fined not more than five hundred nor less than fifty dollars. (7003; 75 v. 522.)

SEC. 257. [Proclamation prohibiting importation of diseased live stock.] Whenever the governor of the state of Ohio shall have good reason to believe that any dangerous, contagious or infectious disease has become epidemic in certain localities in other states, territories or counties, or that there are conditions which render domestic animals of such infected districts liable to convey such disease, he shall by proclamation prohibit the importation of any live stock of the kind diseased into the state, except under such regulations as may be prescribed by the state board of live stock commissioners and approved by the governor. (7468-32; 83 v. 138.)

SEC. 258. [Appraisalment and killing of diseased animals.] When in the opinion of the commissioners provided for by the act to which this is supplementary, it shall be necessary to prevent the further spread of any dangerous, contagious or infectious disease among the live stock of the state, to destroy animals affected with, or which have been exposed to any such disease, it shall determine what animals shall be killed, and shall appraise or cause the same to be appraised by disinterested citizens as hereinafter provided, and cause such animals to be killed, and their carcasses to be disposed of as in the judgment of the commission will best protect the health of the domestic animals of the locality; provided, that no animal shall be appraised, except cattle affected with contagious pleuro-pneumonia, or cattle, sheep or swine affected with foot and mouth disease, or such as have been exposed thereto, nor shall any animal be slaughtered under the provisions of this act unless first examined by a competent veterinarian in the employ of the commission, and the disease with which it is affected or to which it has been exposed adjudged to be a dangerous and contagious malady. (7468-33; 83 v. 139.)

SEC. 259. [Compensation for animals destroyed.] In case of destruction of any animal under the provisions of this act, the compensation to be made for the same by the state, shall be computed upon the basis of the actual value of the diseased animal, if any, at the time of slaughter; for any animal that has been kept in the same building or enclosure two-thirds of such value, and in case [of] other animals destroyed for the extinction of such disease, the full value of the same without reference to the suspicion of contagion; provided, that no compensation shall be made to any person who may have brought animals into the state affected with such contagious disease, or from a district in which such contagious disease existed, or who may have willfully concealed the existence of such disease among his stock or on his premises, or may [have] by willful neglect or purposely contributed to the spread of such contagion, and in appraising animals to be slaughtered as herein provided, no allowance shall be made on account of such animals being thoroughbred, or pedigree stock. (7468-34; 83 v. 139.)

SEC. 260. [Appropriation to pay claims: how made.] All claims against the state by owners of animals slaughtered under the provisions of this act, shall, when approved by the board of live stock commissioners, be reported by said commission to the governor, to be by him communicated to the legislature with the recommendation, if the matter is

approved by him, that the proper appropriations be made to pay such claims. (7468-35; 83 v. 139.)

[The driving of cattle from certain states forbidden during certain months.] WHEREAS, All cattle wintered in the states of Florida, South Carolina, North Carolina, Georgia, Alabama, Mississippi, Louisiana, Tennessee, Arkansas, Texas and the Indian territory, are infected with a germ which renders them capable, except during the frost of winter, of infecting northern cattle with a malady commonly known as "Texas fever," while they show no manifestation of disease; therefore,

SEC. 261. **[Conveyance by railway forbidden, except.]** *Be it enacted by the General Assembly of the State of Ohio,* That during the months of March, April, May, June, July, August, September and October, no cattle shall be permitted to be driven into this state from any of the above mentioned states or Indian territory, or that shall have been wintered therein, nor shall any person or company bring, or cause to be conveyed into this state by railway or otherwise, any such cattle under said conditions, except as specified in the next section of this act. (7468-36; 85 v. 83.)

SEC. 262. **[Unloading of certain cattle in certain months forbidden, except.]** Any railroad or other transportation company conveying into or through this state, or any stock-yard company receiving such cattle during the months aforesaid will not be permitted to unload the same in this state for any other purpose than to be fed and watered or for immediate slaughter, and in yards and premises especially provided for that purpose, into which northern cattle will not be permitted to enter. And the location and arrangement of the said yards and premises and the disinfection of the cars and quarters used in the transportation of such cattle shall be governed by the rules and regulations prescribed by the board of live stock commissioners. (1891, April 23: 7468-37; 88 v. 352.)

SEC. 263. **[Penalty.]** Any person or corporation that shall bring or cause to be brought or driven into this state, any cattle wintered in the states or territory above mentioned, or to be driven or conveyed otherwise than as herein specified, shall, upon conviction thereof, be fined in any sum not less than one hundred dollars, nor more than one thousand dollars, and shall, moreover, be liable for all damages that may be occasioned on account of other cattle being infected with said disease. (7468-38; 85 v. 83.)

SEC. 264. **[Duty of transportation companies; penalty for violation of such duty.]** It shall be the duty of all railway and other transportation companies bringing into and unloading in this state cattle, otherwise than as specified in section 7468-37 of this act, during the months above specified, to require a statement to be made in their shipping bills, showing in what state or territory the cattle shipped were wintered; and it shall be the duty of every railroad company bringing into this state cattle, which may unload such cattle for any other purpose than to be fed and watered as specified in section 7468-37 of this act, to leave at the office of such company nearest the point where such cattle may be unloaded, a copy for public inspection of the statement above required, showing where the same were wintered, and any company or corporation neglecting to comply with the provisions of this section, shall, upon conviction thereof, be fined in any sum not exceeding five hundred dollars. (7468-39; 85 v. 83.)

SEC. 265. **[Prosecution for offenses hereunder.]** Upon the re-

quest of the board of live stock commissioners it shall be the duty of the prosecuting attorney of any county in which the suit may be brought to begin and prosecute any action for the violation of the provisions of this act and the rules and regulations of the board of live stock commissioners. Proceedings against any railway company under this act may be had in any county in this state through which any portion of such company's road may pass, or in which its principal office may be situated; and process may be served by leaving a copy at the office of such company within such county. (1891, April 23: 7468-40; 88 v. 353.)

SEC. 266. [Penalty for selling or failing to keep securely isolated horses, etc., affected with glanders.] Any person owning or having in his charge any horse, mule or ass that he knows or has reason to believe is affected with the disease known as glanders or farcy, or that has been adjudged to be so affected by the state board of live stock commissioners, upon a report made to said board by a competent veterinary surgeon in their employ, after a careful examination of such animal, who shall sell or otherwise dispose of, or secrete the same, or shall fail to keep such animal securely isolated so that contact with other horses, mules or asses shall not be possible, shall, upon conviction of either of said offenses, be fined in any sum not exceeding five hundred dollars, and shall, moreover, be liable for all damages sustained by reason of the same. (7468-41; 85 v. 335.)

SEC. 267. [Appraisal and payment of compensation in case of destruction of such animals by order of live stock commission.] In case the live stock commissioners shall order the destruction of any animal affected with glanders or farcy in the chronic stage of the disease, which may be adjudged capable of rendering some service, the board may cause the animal to be appraised, and order such compensation to be paid out on the order of the live stock commissioners on the warrants of the auditor of state out of any funds in the treasury to the credit of the live stock commission, as in the judgment of the commissioners may be just, not exceeding its cash value; provided the horse was not diseased when passed in possession of the owner. (7468-42; 85 v. 335.)

SEC. 268. [Penalty for suffering sheep afflicted with scab to run at large, or for selling same knowing, etc.] Any person owning or having in charge any sheep affected with foot-rot or scab, who shall suffer the same to run upon any highway, common or other uninclosed ground, or shall sell such sheep, knowing or having reason to believe them to be diseased, without disclosing the fact to the purchaser, shall, upon conviction of either of said offenses, be fined in any sum not exceeding one hundred dollars, and be liable to parties injured for all damages sustained. (7468-43; 85 v. 335.)

SEC. 269. [Permitting dogs to run at large; penalty for refusing to pay tax on dog; method of procedure against offender; killing of animals; etc.] The owner or harbinger of any animal of the dog kind, who permits such animal to be at large away from the premises occupied by him, unaccompanied by any person, shall be fined five dollars. Any person may kill any such animal so running at large, provided, that if any person in attempting to kill such animal so running at large, fails to kill and wounds the same, he shall not be liable to prosecution under section 6951, and any person the owner or harbinger of any animal of the dog kind, who refuses to pay the tax provided for in section 2833 of the Revised Statutes, or fails to return as required by law to the assessors, for taxation, a dog owned or harbored by him, liable to be taxed, shall be deemed

guilty of an offense and shall be fined in any sum not exceeding five dollars, and the prosecuting attorney shall and without their securing or becoming liable for costs, upon the request of two or more property owners of the county in which he is prosecutor, and upon affidavit being filed with him charging a violation of this section, file with the probate judge his information as to the violation of the provisions of this act, and thereupon said court shall proceed against such person or persons as made and provided for by statutes, for the trial of criminal cases in probate court, and the judge of said court shall direct any constable or marshal, or may depute any person to take possession of such animal, upon the arrest of the owner or harbinger thereof, and shall after five days, and within ten days after conviction of the owner or harbinger thereof, kill such animal, provided the tax, fine and costs or any part thereof remain unpaid, provided however, that any dog returned for taxation and the tax on which is paid when due shall be regarded as, and shall be property, and shall be entitled to the same protection, as other live stock, but no recovery shall be had for the malicious and unlawful injury or killing of such animal in excess of double the amount for which any such dog is listed for taxation. (1891, May 4: 7008; 88 v. 518.)

CRUELTY TO ANIMALS.

SEC. 270. [**Cruelty to animals.**] Whoever overdrives, overloads, tortures, torments, deprives of necessary sustenance, or unnecessarily or cruelly beats, or needlessly mutilates or kills, any animal, or impounds or confines any animal in any place and fails to supply the same during such confinement with a sufficient quantity of good, wholesome food and water, or carries in or upon any vehicle, or otherwise, any animal in a cruel or inhuman manner, or who keeps cows or other animals in any inclosure without wholesome exercise and change of air, or feeds cows on food that produces impure or unwholesome milk, or abandons to die any maimed, sick, infirm, or diseased animal, or being a person or corporation engaged in transporting live stock, detains such stock in railroad cars, or in compartments, for a longer continuous period than twenty-four hours after the same are so placed, either within or beyond this state, without supplying the same with necessary food, water and attention, or permits such stock to be so crowded together as to overlie, crush, wound, or kill each other, shall be fined not more than two hundred nor less than five dollars, or imprisoned not more than sixty days, or both; provided, that all fines collected for violations of this section, shall be paid to the society or association for the prevention of cruelty to animals, if any such society or association is organized in such township, village or city, where such violation occurred. (6951; 78 v. 134.)

DIVISION XIII.

Relating to Vital Statistics.

SEC. 271. [Certificate of marriage to be transmitted to probate judge and recorded.] A certificate of every marriage hereafter solemnized, whether authorized by publication of bans in the congregation, or by license issued by a probate judge, or after notice given to the congregation, signed by the justice, mayor or minister solemnizing the same, or clerk of the monthly meeting shall be transmitted to the probate judge in the county wherein the marriage license was issued, or the congregation wherein said bans were published is situated, or marriage was celebrated, within three months thereafter, and recorded by such probate judge; every justice, mayor, or minister, or clerk of the monthly meeting, failing to transmit such certificate to the probate judge in due time, shall forfeit and pay fifty dollars, and if the probate judge shall neglect to make such record, he shall forfeit and pay fifty dollars to and for the use of the county. (6391; 86 v. 208.)

SEC. 272. [Probate judge shall keep a record of births and deaths.] The probate judge shall keep a record of the births and deaths reported to him, as hereinafter provided; the births shall be numbered, recorded, and alphabetically indexed in the order in which they are received, and the record shall state, in separate columns, the date of making the record, the date and place of birth, the name, sex, and color of the child, the maiden name of the mother, and the name of the father of the child, and the residence of the parents, as fully as the same are reported; the deaths shall be likewise numbered, recorded, and indexed, and the record thereof shall state in separate columns, so far as the same is reported, the date and place of death, name and surname of the deceased, condition (whether single, married, or widowed), age, place of birth, occupation, names of parents (when an infant without name), cause of death, color, and last place of residence of such deceased person, and the date of making the record. (6395; 66 v. 69.)

SEC. 273. [Statistics to be obtained annually by assessors; duties of physicians and midwives in certain cities; of clergymen and sextons.] It shall be the duty of the assessors of the several townships and wards of each county of this state, to obtain, annually, the foregoing statistics, at the time each assessor shall make the assessment of his respective township or ward for the year ending the last of March, preceding each annual assessment, and report the same to the probate judge of his county, at the time of his regular report to the [county] auditor; and at the time of submitting his report to the probate judge, he shall state upon oath that he has made diligent inquiry in order to obtain the number of births and deaths, and other information required by this chapter, in his township or ward, respectively; and if any assessor in this state shall fail or refuse to make such report, or to make and file the affidavit required by this title, the auditor of his county shall withhold his order until the law

has been complied with, to the satisfaction of the probate judge, except in counties containing cities of the first class, having a population of one hundred and fifty thousand and over, in which counties it shall be the duty of the physicians and professional midwives to keep a registry of the several births in which they have assisted professionally, which shall contain, as near as the same can be ascertained, the time of such birth, sex, color of the child, the names and residence of the parents; and physicians who have attended deceased persons in their last illness, clergymen who have officiated at the funeral, and sextons who have buried deceased persons, shall keep a registry of the name, age, and residence of such deceased persons at the time of their death; it shall be the duty of the physicians and professional midwives to report fully the births registered by them, as required by this chapter, to the judge of the probate court of the county every three months, viz, on or before the second Monday of the months of January, April, July, and October of each year; in case there is no physician or midwife in attendance at any birth, then the parents shall be required to report to the probate judge within one month; and physicians, clergymen, and sextons shall likewise report fully the deaths registered by them, as required by this chapter, to the judge of the probate court of the county, every three months, as above designated; and any person who shall neglect or refuse to comply with, or violate the provisions of this chapter, shall forfeit and pay for each offense the sum of ten dollars, to be sued for and recovered in the name of the state of Ohio, and the penalty, when recovered, shall be paid over, one-half to the school fund, and one-half to the party making complaint thereof. (6396; 68 v. 49.)

SEC. 274. [Duty of probate judge as to blanks for statistics.] It shall be the duty of the probate judge to furnish to each assessor of the several townships or wards of his county, annually, and to other persons making such report, a sufficient number of properly ruled blanks, which shall be paid for out of the county treasury, upon which to make such report to said probate judge. (6397; 66 v. 69.)

SEC. 275. [Probate judge to keep record, and transmit abstract to secretary of state.] It shall be the duty of the probate judge, receiving the reports as above specified, within fifteen days after the receipts thereof, to record the same in a book to be provided by the county commissioners for that purpose, and to transmit an abstract thereof, on or before the first Monday of August, every year, to the secretary of state, in such form as shall be prescribed by that officer, who shall file the same in his office, to be used by him in his annual report to the legislature. (6398; 73 v. 203.)

SEC. 276. [Evidence in courts.] Every original entry, made as above described, and a copy of such entry duly certified over the seal of said court, shall be received in all courts and places as prima facie evidence of the facts therein stated, and said records shall be open to the inspection of the public at all proper hours. (6399; 66 v. 69.)

DIVISION XIV.

RELATING TO

Contagious Diseases ; Vaccination ; Cemeteries ; Jails ; Instruction in Hygiene ;
Protection of Children ; Enforcement of Ordinances.

CONTAGIOUS AND INFECTIOUS DISEASES.

SEC. 277. [On complaint of infectious disease township clerk shall call a meeting of trustees, etc.] When complaint is made to the clerk of a township or a reasonable belief exists that the small-pox or any other infectious or loathsome disease prevails in any locality or house therein or in any adjoining township, and not within the limits of a city or incorporated village, said clerk shall call a meeting of the board of trustees of the township, and the board, if satisfied after investigation that such action is necessary, shall restrain all persons except physicians and necessary attendants from visiting or frequenting such house or locality within the township, or coming into such township from an infected locality in any other township, until the danger of infection or contagion therefrom has ceased, and they shall cause a copy of said order to be posted up in at least three of the most public places in the township. (1462; 79 v. 50.)

SEC. 278. [Trustees to make regulations to prevent spread of disease.] The board of trustees shall have power to make and enforce all necessary health regulations to prevent the spread of small pox or any other loathsome disease within the township, and restrain persons convalescing from small pox or knowing themselves to have been exposed thereto from coming from infected localities into such townships; and any person violating such order or health regulation after the same has been published or posted up as provided in the next preceding section of this act, shall be liable to a penalty of not less than ten nor more than fifty dollars and costs, to be recovered by said board of trustees in an action before any justice of the peace in said township; said penalties, when collected, to be paid to the township treasurer for township purposes. (1463; 79 v. 50.)

SEC. 279. [Board may make and enforce rules for vaccination.] The board of each district may make and enforce such rules and regulations to secure the vaccination of, and to prevent the spread of small-pox among, the pupils attending or eligible to attend the schools of the dis-

trict, as in its opinion the safety and interest of the public require; and the boards of health and councils of municipal corporations, and the trustees of townships, shall, on application of the board of education of the district, provide at the public expense, without delay, the means of vaccination to such pupils as are not provided therewith by their parents or guardians. (3986; 69 v. 22.)

DEAD BODIES.

SEC. 280. [Regulating the burial of the dead in villages.] That villages shall not have the power to prohibit the interment of the dead in any cemetery within such village, unless it shall be satisfactorily shown that such interring is detrimental to the health of its inhabitants and general prosperity of such villages. (8223-147; 86 v. 179.)

SEC. 281. [Penalty for corpse nuisance.] If the sexton or other person in charge of a township, or other cemetery suffers the dead to remain in any vault or other receptacle until the same become offensive, he shall be liable, on the complaint of any person before a justice of the peace of the township, to a fine of not over twenty dollars, and an additional penalty of five dollars for every day, after the fine aforesaid, that the nuisance is continued. (1470; 54 v. 187.)

SEC. 282. [May be removed, etc.] The trustees shall, when the dead laid in any vault or other receptacle become offensive, on complaint of any householder of the township, issue an order forthwith to the sexton or other person in charge, to have the same immediately interred; and in case the interment is neglected for three days after the complaint, any justice of the peace of the township may issue his written order to any householder of the township to inter the dead at the expense of the trustees, and shall allow a reasonable charge for the service aforesaid. (1471; 54 v. 187.)

JAILS.

SEC. 283. [Jailer suffering jail to become unclean, etc.] A sheriff, or jailer, or other person, having the care and custody of any jail, who suffers the same to become foul or unclean, so that the health of any prisoner may be endangered, or suffers any prisoner, sentenced to imprisonment for any criminal offense, to be dealt with in a manner less strictly than intended by the sentence, shall be fined not more than one hundred dollars. (6916; 29 v. 144)

SEC. 284. [The grand jury to visit the jail.] The grand jurors shall, once at each term of the court, visit the county jail, examine its state and condition, and inquire into the discipline and treatment of the prisoners, and their habits, diet, and accommodations; and they shall report to the court, in writing, whether the rules prescribed by the judge have been faithfully kept and observed, and whether any provision of law for the regulation of county jails has been violated, pointing out particularly in what such violation, if any, consists. (7209; 66 v. 300.)

INSTRUCTION IN HYGIENE IN THE PUBLIC SCHOOLS.

SEC. 285. [Instruction as to effect of alcoholic drinks and narcotics on the human system required in public schools; provision therefor, etc.] The nature of alcoholic drinks and narcotics, and their effects on the

human system in connection with the subject of physiology and hygiene, shall be included in the branches to be regularly taught in the common schools of the state, and in all educational institutions supported wholly or in part by money received from the state; and it shall be the duty of boards of education, and boards of such educational institutions, to make provisions for such instruction in the schools and institutions under their jurisdiction, and to adopt such methods as shall adapt the same to the capacity of the pupils in the various grades therein; but it shall be deemed a sufficient compliance with the requirements of this section if provision be made for such instruction orally only, and without the use of text-books by the pupils. (8092-33; 85 v. 213.)

SEC. 286. [Examination required of teachers.] No certificate shall be granted to any person on or after the first day of January, 1890, to teach in the common schools, or in any educational institution supported as aforesaid, who does not pass a satisfactory examination as to the nature of alcoholic drinks and narcotics and their effects upon the human system. (8092-34; 85 v. 213.)

SEC. 287. [Penalty for refusal or neglect to give such instruction.] Any superintendent or principal of, or teacher in any common school or educational institution supported as aforesaid, who willfully refuses or neglects to give the instruction required by this act, shall be dismissed from his or her employment. (8092-35; 85 v. 213.)

PROTECTION OF CHILDREN.

SEC. 288. [Employing children under fourteen years in shows, etc.] Whoever takes, receives, hires, employs, uses, exhibits, or in any manner, or under any pretense, sells, apprentices, gives away, lets out, or otherwise disposes of, to any person, any child under the age of fourteen years, for or in the vocation, occupation, service, or purpose of singing, playing on musical instruments, rope or wire walking, dancing, begging, or peddling, or as a gymnast, contortionist, rider, or acrobat, or for or in any obscene, indecent or immoral purpose, exhibition, or practice, or for or in any business, exhibition, or vocation injurious to the health or dangerous to the life or limbs of such child, or causes, or procures, or encourages, any such child to engage therein, or causes or permits any such child to suffer, or inflicts upon it, unjustifiable physical pain or mental suffering, or willfully causes or permits the life of any such child to be endangered, or its health to be injured, or such child to be placed in such situation that its life may be endangered, or its health injured, or has in custody any such child for any of the purposes aforesaid, shall be fined not more than two hundred dollars, or imprisoned not more than six months or both. (6984; 73 v. 219.)

SEC. 289. [Penalty for injuring or neglecting children.] Whoever tortures, torments, cruelly, or unlawfully punishes, or willfully, unlawfully and negligently deprives of necessary food, clothing or shelter, any person and whoever having the control of, or being the parent or guardian of any child or children under the age of sixteen years willfully abandons such child or children, or tortures, torments, cruelly or unlawfully punishes, or willfully, unlawfully, and negligently deprives of necessary food, clothing or shelter, such child or children shall be fined not more than two hundred dollars, nor less than ten dollars, or imprisoned for not more than six months or both. (6984a. 83 v. 27.)

SEC. 290. [**Prohibiting sale of cigarettes and tobacco to minors.**] Whoever sells, gives or furnishes to any minor under fifteen years of age, any cigarette, cigar or tobacco, shall be fined not less than five dollars nor more than twenty-five dollars, or imprisoned not more than thirty days, or both. (6986-1; 85 v. 169.)

SEC. 291. [**Intoxicating liquors: unlawful for minor to enter place where sold; exceptions.**] It shall be unlawful for any minor to enter any saloon, beer-garden or other place where intoxicating liquors are sold or offered for sale, except in the discharge of some lawful business or accompanied by a parent or guardian. (1891, April 28; 88 v. 409.)

SEC. 292. [**Penalty.**] Any person so offending shall, for the first offense upon conviction thereof, be fined not more than five dollars (\$5.00), nor less than one dollar (\$1.00), and for any subsequent offense shall, upon conviction or convictions thereof, be fined not more than twenty-five dollars (\$25.00), nor less than five dollars (\$5.00), or be imprisoned not more than ten days (10), or both. (1891, April 28; 88 v. 409.)

SEC. 293. [**Penalty for permitting minor to loiter where sold; employment of minors.**] The keeper or person having in charge any saloon, beer garden, or other place where intoxicating liquors are sold or offered for sale, who shall knowingly permit any minor less than eighteen years of age, except as provided in section one, to enter and remain in said place where intoxicating liquors are sold or offered for sale as aforesaid, except members of his own family, shall be fined not more than twenty-five dollars nor less than five dollars, or be imprisoned not more than ten days, or both. Nothing herein contained shall be construed as prohibiting the employment of any minor to do or perform labor in any part or department of any building, other than the room wherein the saloon or other place in said building wherein intoxicating liquors are sold or offered for sale. (1891, April 28; 88 v. 409.)

SEC. 294. [**Drug stores.**] Nothing in this act, shall be construed to prohibit minors from entering the drug store of any druggist doing business under the laws of this state, and who sells intoxicating liquors only on physicians' prescription. (1891, April 28; 88 v. 410.)

ENFORCEMENT OF ORDINANCES.

SEC. 295. [**Final jurisdiction under ordinances.**] In villages, the mayor shall have final jurisdiction to hear and determine any prosecution for the violation of an ordinance of the corporation, unless imprisonment is prescribed as part of the punishment. (1823; 69 v. 169.)

SEC. 296. [**How ordinances, etc., enforced.**] By-laws and ordinances of municipal corporations may be enforced by the imposition of fines, forfeitures, and penalties, on any person offending against any such by-law or ordinance; and the fine, penalty, or forfeiture may be prescribed in each particular by-law or ordinance, or by a general by-law or ordinance made for that purpose; and the municipal corporation shall have power to provide, in like manner, for the prosecution, recovery, and collection of such fines, penalties, or forfeitures. (1861; 66 v. 167.)

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